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OFFICIAL GAZETTE

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PATENTS

August 6, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 6, 1985 Volume 1057 Number 1

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ENGINEERING LIBRARY

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

May 7, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 3, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,342,121 through 4,343,043

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,017,127, Re. S.N. 748,414, Filed June 24, 1985, Cl. 384/294, SLEEVE TYPE FLANGED BEARING, John R. Smith, et al., Owner of Record: *Federal-Mogul Corp., Southfield, Mich.,* Attorney or Agent: Robert F. Hess, et al., Ex. Gp.: 245

4,381,582, Re. S.N. 729,695, Filed June 14, 1985, Cl. 17/44.3, PLANT AND GRIPPING MEANS FOR CUTTING UP MEAT, Kaarlo J. Korhonen, Owner of Record: *AB Proman, Klippman, Sweden,* Attorney or Agent: Benton S. Duffett, Jr., Ex. Gp.: 327

4,395,463, Re. S.N. 748,806, Filed June 24, 1985, Cl. 428/447, ARTICLE COMPRISING SILICONE RESIN COATED, METHACRYLATE-PRIMED SUBSTRATE, William D. Kray, Owner of Record: *General Electric Co., Waterford, N.Y.,* Attorney or Agent: John L. Young, et al., Ex. Gp.: 154

4,488,644, Re. S.N. 737,505, Filed June 26, 1985, Cl. 206/387, PACKAGING SYSTEM FOR VIDEO CASSETTES, Robert M. Wynalda, Owner of Record: *Wynalda Litho, Inc., Rockford, Mich.,* Attorney or Agent: Peter P. Price, et al., Ex. Gp.: 241

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,449,911, Reexam. No. 90/000,806, Requested: June 19, 1985, Cl. 60/453, POWER TRANSFER SYSTEM, Paul W. Schlosser, Owner of Record: *Muncie Power Products, Inc., Muncie, Ind.,* Attorney or Agent: Geoffrey R. Myers, Ex. Gp.: 340, Requester: Dana Corp., Toledo, Ohio

3,995,018, Reexam. No. 90/000,807, Requested: June 27, 1985, Cl. 424/1.1, METHOD OF BINDING IMMUNOGLOBULIN EMPLOYING A POLYPEPTIDE FROM MICROORGANISMS, John A. Sjoquist, Owner of Record: *Pharmacia Aktiebolag, Uppsala, Sweden,* Attorney or Agent: Fred Philpitt, Ex. Gp.: 223, Requester: Roman Salwanchik, Richland, Mich.

4,315,963, Reexam. No. 90/000,805, Requested: June 18, 1985, Cl. 428/35, THERMOPLASTIC FILM WITH INTEGRAL RIBBED PATTERN AND BAG THEREFROM, Carl B. Havens, Owner of Record: *Dow Chemical Co., Midland, Mich.,* Attorney or Agent: Lloyd E. Hessenaur, Jr., Ex. Gp.: 150, Requester: Morris Fidelman, Washington, D.C.

4,373,058, Reexam. No. 90/000,803, Requested: June 17, 1985, Cl. 524/705, POLYMER CONCRETE COMPRISING FURFURYL ALCOHOL RESIN, Lowell C. Horton, Owner of Record: *Horton Co., Gulf Breeze, Fla.,* Attorney or Agent: Raiford A. Blackstone, Ex. Gp.: 151, Requester: Quaker Oats Co., Chicago, Ill.

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Dec. 22, 1981, was ordered cancelled and restored to pendency as Trademark Serial Number 73/210,944, as being inadvertently issued by an order dated Oct. 19, 1982, signed by the Assistant Commissioner for Trademarks:

1,182,708	TM 369 and TM 371	Dec. 22, 1981

Consequently, the certificate of registration bearing the above-identified registration number has been cancelled as inadvertently issued. The registration number accordingly has been vacated.

Serial Number 73/210,944 subsequently matured into Registration Number 1,304,710 on Nov. 13, 1984 at page TM 375.

July 10, 1985. PATRICIA M. DAVIS,
Administrator,
for Trademark Operations.

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of Nov. 9, 1982, was listed inadvertently:

1,216,234	TM 297	Nov. 9, 1982

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

July 3, 1985. PATRICIA M. DAVIS,
Administrator,
for Trademark Operations.

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of June 4, 1985, was listed inadvertently:

1,339,690	TM 217	June 4, 1985

Consequently, the certificate of registration bearing the above-identified registration number was not issued on the date indicated, and the registration number has been vacated.

June 28, 1985. PATRICIA M. DAVIS,
Administrator,
for Trademark Operations.

Errata

The following registration numbers, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of June 18, 1985, were listed inadvertently:

1,341,919	TM 194	June 18, 1985
1,342,234	TM 201	June 18, 1985
1,342,428	TM 204	June 18, 1985
1,342,726	TM 211	June 18, 1985
1,343,165	TM 219	June 18, 1985
1,343,251	TM 221	June 18, 1985
1,343,341	TM 223	June 18, 1985
1,343,544	TM 228	June 18, 1985
1,343,548	TM 228	June 18, 1985
1,343,568	TM 228	June 18, 1985

Consequently, the certificates of registration bearing the above-identified registration numbers were not issued on the date indicated, and the registration numbers have been vacated.

July 2, 1985. PATRICIA M. DAVIS,
Administrator,
for Trademark Operations.

Errata

The following registration number, listed in the "Trademark Registrations Issued" section of the Trademark Official Gazette of June 25, 1985, was listed inadvertently:

1,344,671	TM 227	June 25, 1985

Consequently, the certificate of registration bearing the above-identified registration number was not issued

on the date indicated, and the registration number has been vacated.

PATRICIA M. DAVIS,
July 2, 1985. *Administrator,*
for Trademark Operations.

Errata

"All reference to Patent No. 4,526,829 to James S. Holtrop, et al., of Conn. for 'THERMOFORMABLE LAMINATE STRUCTURE' appearing in the Official Gazette of July 2, 1985, should be deleted since no patent was granted."

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-332,906 (4,517,080). APPARATUS FOR ENCAPSULATING ADDITIVES IN RESEALED ERYTHROCYTES.
SN 6-380,374 (4,516,385). WRAPPING MACHINE.
SN 6-738,707. CONTROL OF EASTERN BLACK NIGHTSHADE WITH A FUNGAL PATHOGEN.
SN 6-738,815. OIL-ABSORBENT CELLULOSIC DERIVATIVES.

DEPARTMENT OF COMMERCE

SN 6-436,124 (4,525,067). TWIN-ETALON SCANNING SPECTROMETER.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-553,387 (4,517,665). ACOUSTICALLY TRANSPARENT HYDROPHONE PROBE.
SN 6-706,622. USE OF PARAMAGNETIC METALLOPORPHYRINS AS CONTRAST AGENTS FOR TUMORS IN NMR IMAGIING.
SN 6-717,613. THERAPEUTIC AND DIAGNOSTIC MONOCLONAL ANTIBODY SPECIFIC FOR HUMAN T-CELL LEUKEMIA VIRUS TYPES I ENVELOPES PROTEIN.
SN 6-729,206. VACCINE AGAINST NEISSERIA MENINGITIDIS GROUP B SEROTYPE 2 INVASIVE DISEASE.
SN 6-740,171. MEDICAL APPARATUS.

DEPARTMENT OF THE AIR FORCE

SN 6-465,227. OPTICAL CORRELATOR.
SN 6-547,610. ANAGLYPHIC STEREOSCOPIC IMAGE APPARATUS AND METHOD.
SN 6-632,179. ELECTROCHROMIC DISPLAY DEVICE.
SN 6-657,092. TRANSCEIVER TEST DEVICE.
SN 6-689,700. MICROCOMPUTER CONTROLLED IMAGE PROCESSOR.
SN 6-690,212. REMOVABLE CLEANABLE ANTI-REFLECTION SHIELD.
SN 6-696,129. SOIL EXTRACTION KIT.
SN 6-706,205. PROCESS FOR IMPROVING THE QUALITY OF EPITAXIAL SILICON FILMS GROWN ON INSULATING SUBSTRATES.
SN 6-716,863. METHOD OF CHARACTERIZING CRITICAL TIMING PATHS AND ANALYZING TIMING RELATED FAILURE MODES IN VERY LARGE SCALE INTEGRATED CIRCUITS.
SN 6-720,126. ROBOTIC ORDER PICKING.
SN 6-721,836. BRUSH AND COMMUTATOR SEGMENT TORQUER MOTOR.
SN 6-721,977. DIFFERENTIATING SPATIAL LIGHT MODULATOR.
SN 6-724,714. WIDE-BAND PHASE LOCKED LOOP AMPLIFIER APPARATUS.
SN 6-724,719. CARBON/CARBON COMBUSTOR EXTERNAL INSULATION.
SN 6-726,558. LOW NOISE POLYCRYSTALLINE SEMICONDUCTOR RESISTORS BY HYDROGEN PASSIVATION.
SN 6-729,389. HERMETIC CHIP CARRIER.
SN 6-731,646. REDUCING GRATING LOBES DUE TO SUBARRAY AMPLITUDE TAPERING.
SN 6-733,991. MAINTENANCE PORT SYSTEM.
SN 6-737,377. ROTOR BLADE TEST APPARATUS.

DEPARTMENT OF THE ARMY

SN 6-737,627. MICROWAVE SAW MONOCHROMATOR.

Department of the Treasury
United States Customs Service
Application for Recordation of Trade Name:
"INTERNATIONAL BUSINESS MACHINE CORPORATION"

Agency: U.S. Customs Service, Department of the Treasury.

Action: Notice of Application for Recordation of Trade name.

Summary: Application has been filed pursuant to section 133.12, Customs Regulations (19 CFR 133.12), for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "INTERNATIONAL BUSINESS MACHINES CORPORATION" used by the International Business Machines Corp., a corporation organized under the laws of the State of New York, located at Old Orchard Rd., Armonk, N.Y. 10504.

The application states that the trade name is used in connection with the following merchandise manufactured in numerous foreign countries: information handling systems and associated components and supplies including data processing equipment; copying machines; printers; word processing; electro-mechanical office equipment; computers; terminals; input and output devices, computer programs; magnetic tape; magnetic disks; diskettes; modems; books, business forms, typewriter ribbons; educational publications; and type fonts.

Before final action is taken on the application, consideration will be given to any relevant data, views, or arguments submitted in opposition to the recordation of this trade name. Notice of the action taken on the application for recordation of this trade name will be published in the Federal Register.

Date: Comments must be received on or before Aug. 26, 1985.

Address: Written comments should be addressed to the Commissioner of Customs, Attention: Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Rm. 2417, Washington, D.C. 20229.
For Further Information Contact: Beatrice E. Moore, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

EDWARD T. ROSSE,
Acting Director,
Entry Procedures and Penalties Division.

June 20, 1985.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by registered mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Armor Coatins, Inc., Suffield, Conn., Reg. No. 1,134,391, for the mark "ARMORTHANE", Canc. No. 14.490.

New York Airways, Inc., Flushing, N.Y., Reg. No. 807,662, for the mark "SKY BUS" and design, Canc. No. 14,786.

ERMA S. BROWN,
Administrator
Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

PATENT NOTICES

Certificates of Correction for the Week of Aug. 6, 1985

PP. 5,418	4,465,427	4,491,493	4,501,426
Re. 31,733	4,467,166	4,491,506	4,501,627
D. 274,168	4,468,316	4,491,782	4,501,750
D. 276,453	4,470,226	4,491,859	4,502,248
D. 277,872	4,470,653	4,491,888	4,502,298
3,678,155	4,471,995	4,491,927	4,502,492
3,923,876	4,473,462	4,491,934	4,502,557
3,990,753	4,475,328	4,492,693	4,503,001
4,122,261	4,475,516	4,493,227	4,503,057
4,175,987	4,476,636	4,493,805	4,503,082
4,221,961	4,476,905	4,493,837	4,503,315
4,259,092	4,477,230	4,494,542	4,503,339
4,318,298	4,477,587	4,494,591	4,503,545
4,348,791	4,477,726	4,494,914	4,504,196
4,352,740	4,477,950	4,495,255	4,504,323
4,360,937	4,478,307	4,495,405	4,504,456
4,373,920	4,479,050	4,495,443	4,504,501
4,393,637	4,479,100	4,495,642	4,504,510
4,399,195	4,480,404	4,496,784	4,504,532
4,402,172	4,481,026	4,496,785	4,504,645
4,402,951	4,481,271	4,496,889	4,504,959
4,409,339	4,481,610	4,496,899	4,505,082
4,409,664	4,483,243	4,497,019	4,505,293
4,413,576	4,484,293	4,497,203	4,505,501
4,427,452	4,484,582	4,497,452	4,505,907
4,428,382	4,484,636	4,497,498	4,506,296
4,440,636	4,485,858	4,497,566	4,506,298
4,440,843	4,486,090	4,497,591	4,506,660
4,443,331	4,486,485	4,497,597	4,506,785
4,445,933	4,486,708	4,497,663	4,507.174
4,447,268	4,487,004	4,497,786	4,507,237
4,449,182	4,487,216	4,497,970	4,508,171
4,451,396	4,487,688	4,498,068	4,508,183
4,451,618	4,488,187	4,498,118	4,509,007
4,452,683	4,488,744	4,499,285	4,510,287
4,454,915	4,488,886	4,499,314	4,510,775
4,455,301	4,488,946	4,499,498	4,510,854
4,455,401	4,489,261	4,499,834	4,510,962
4,457,374	4,489,319	4,500,321	4,511,318
4,460,898	4,489,397	4,500,548	4,511,338
4,462,362	4,489,539	4,500,581	4,511,532
4,463,267	4,489,721	4,500,589	4,512,897
4,464,993	4,491,009	4,501,117	4,524,771
4,464,994	4,491,247	4,501,333	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware Library	(302) 451-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF July 6, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-20-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	4-11-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	7-16-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-11-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-30-82
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	4-14-83
DESIGN, GROUP 290—K. L. CAGE, Director	2-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-14-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-27-83

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,390,405 to 3,395,405, inclusive

Plant Patents ..... Numbers 2,817 to 2,824 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 6, 1985

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T105,701

METHOD TO IMPROVED ACIDULATION QUALITY OF NORTH CAROLINA PHOSPHATE ROCK

Alexander D. Mair, Rte. 7, Box 143, Florence, Ala. 35630

Filed Sep. 10, 1984, Ser. No. 649,034

Int. Cl.³ C01B *25/30*

U.S. Cl. 423—167

No Drawing. 23 Pages Specification

Phosphate rock is heated under controlled conditions to essentially eliminate organic impurities and sulfides from the rock when subsequently leached with water to thereby substantially increase the porosity and surface area of the calcined solid and remove any traces of sulfide still remaining in the calcine. This process yields an improved calcined product rendered more suitable for acidulation to wet-process phosphoric acid and is of benefit for unweathered apatitic phosphate rocks of the mineral class known as francolites posessing a moderate to high content of organic impurities and a high degree of carbonate substitution in the apatite crystal lattice, such as that rock originating from the Pungo River Formation of North Carolina. For North Carolina rock, inclusion of the leaching step after calcination at about 800° C. may beneficially provide up to a twentyfold increase in calcine surface area to a level of at least 2 m^2/g and a sulfide content decreased to less than about 0.01 percent by weight.

T105,702

NONDIFFUSIBLE PHOTOGRAPHIC COUPLERS AND PHOTOGRAPHIC ELEMENTS AND PROCESSES EMPLOYING SAME

Gregory J. Lestina, Kodak Park Works, Rochester, N.Y. 14650

Continuation of Ser. No. 474,372, Mar. 11, 1983, abandoned, which is a division of Ser. No. 366,885, Apr. 18, 1982, Pat. No. 4,443,536, which is a continuation-in-part of Ser. No. 296,086, Aug. 26, 1981, abandoned. This application May 25, 1984, Ser. No. 613,993

Int. Cl.³ C07D *249/08*

U.S. Cl. 548—262

No Drawing. 55 Pages Specification

Photographic couplers comprising a coupler moiety and a ballast moiety have advantageous properties when the ballast moiety is terminated with a hydroxyphenylsulfonyl or hydroxyphenylsulfinyl group. The couplers are useful in photographic emulsions and element.

REISSUES

AUGUST 6, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

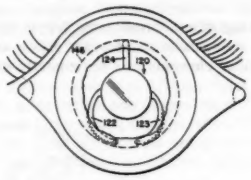
Re. 31,963
INTRAOCULAR LENSES

Charles D. Kelman, North Shore Towers, 269 Grand Central Pkwy., Floral Park, N.Y. 11005

Original No. 4,343,050, dated Aug. 10, 1982, Ser. No. 167,923, Jul. 14, 1980. Application for reissue Feb. 4, 1983, Ser. No. 463,845

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 623—6 **24 Claims**



24. An intraocular lens with flexible support suitable for use as an artificial lens in the interior of a human eye and insertable through an incision in said eye, said eye interior having first and second groove portions extending peripherally at lower and upper portions of the eye when viewed in cross-section, said lens comprising a light-focusing lens body, position fixation means and a stabilizing member joined to said lens body and extending generally beyond the periphery of said lens body, said position fixation means being engageable with said first groove portion and being resiliently deformable in response to a force applied thereto, between a first undeformed condition, in which the distance between the peripherally most remote edges of said position fixation means precludes insertion of the lens through an incision of a given length, and a second deformed condition, in which the distance between the peripherally most remote edges of said position fixation means is such as to permit insertion of the lens through said incision of given length, said position fixation means being capable of spontaneously returning toward substantially said first condition thereof upon removal of said applied force after said lens has been inserted into the eye, said position fixation means comprising first and second support portions disposed generally outwardly of said lens body, said first and second support portions each having a seating portion which contacts said first groove portion of the eye, said first and second support portions of said position fixation means in said second condition being generally "C" shaped, the respective concave edges of the support portions facing each other and the outer edge of each of the seating portions comprising at least one protrusion.

Re. 31,964
AUTOMATIC DEVELOPMENT ELECTRODE BIAS CONTROL SYSTEM

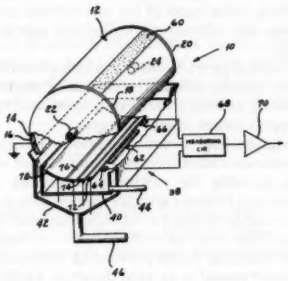
Louis F. Schaefer, Palo Alto, and Kenneth W. Gardiner, Menlo Park, both of Calif., assignors to Savin Corporation, Stamford, Conn.

Original No. 3,892,481, dated Jul. 1, 1975, Ser. No. 479,659, Jun. 17, 1974. Continuation of Ser. No. 811,460, Jun. 29, 1977, abandoned. Application for reissue Jun. 27, 1983, Ser. No. 507,958

Int. Cl.³ G03G *9/04*

U.S. Cl. 355—10 **42 Claims**

1. A system for automatically controlling the biasing potential on a developer electrode in an electrostatic copying machine including in combination, a support, a surface layer of photoconductive material on said support adapted to receive a latent electrostatic image to be developed, a developer unit for contacting developer fluid with said image to develop the same, a biasing electrode in said developer unit, a sensing electrode insulated from ground, means mounting said sensing electrode in said developer unit at a location at which developer fluid is positioned between and in contact with both said photoconductive surface and said sensing electrode to enable said sensing electrode to assume substantially the potential on said surface by conduction, and means responsive to the potential of said sensing electrode for applying a biasing potential to said biasing electrode.



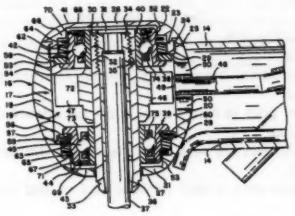
Re. 31,965
COMPLIANTLY MOUNTABLE TURBINE CARTRIDGE ASSEMBLY FOR GAS-DRIVEN DENTAL HANDPIECE

Frank W. Kerfoot, Jr., Newtown Square, Pa., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Original No. 4,249,896, dated Feb. 10, 1981, Ser. No. 947,215, Sep. 29, 1978. Application for reissue Nov. 2, 1981, Ser. No. 317,698

Int. Cl.³ A61C *1/05*

U.S. Cl. 433—132 **67 Claims**



1. A dental handpiece comprising a gas-driven motor, said motor including a housing and a turbine cartridge assembly within said housing, said housing defined by a substantially cylindrical side wall and by a pair of oppositely disposed end walls transverse to said side wall, said housing having turbine cartridge assembly support means located on portions of said walls for supporting said turbine cartridge assembly, said turbine cartridge assembly removably positionable as a unitary assembly within said housing, said turbine cartridge assembly comprising:

a rotor shaft having a plurality of vanes thereon, said rotor shaft having an axis of rotation substantially coincident with the axis of said substantially cylindrical side wall of said housing;

a first bearing assembly comprising an inner race fixed to said rotor shaft, an outer race, and a plurality of movable bearing elements frictionally engaged with and confined between said inner race and said outer race;

a second bearing assembly comprising an inner race fixed to said rotor shaft, an outer race, and a plurality of movable bearing elements frictionally engaged with and confined between said inner race and said outer race of said second bearing assembly;

radial support means associated with each of said first and second bearing assemblies, said radial support means providing radial support for said turbine cartridge assembly upon said substantially cylindrical side wall of said housing;

rigid axial support means connected to said outer race of said first bearing assembly for axially supporting said first bearing assembly outer race upon said turbine cartridge support means of said housing;

bearing pre-load means comprising flexible axial support means associated with said outer race of said second bearing assembly for yieldingly supporting said outer race upon said turbine cartridge support means of said housing;

first retaining means for retaining said radial support means upon said outer race of said first bearing assembly, said first retaining means preventing movement of said radial support means in an axial direction away from said rotor shaft vanes; and

second retaining means for retaining said radial support means and said flexible axial support means upon said outer race of said second bearing assembly, said second retaining means preventing movement of said radial support means and said flexible support means in an axial direction away from said rotor shaft vanes;

whereby said rigid axial support means and said flexible axial support means coact with turbine cartridge support means of said housing to provide axial pre-loading of said first and second bearing assemblies when said turbine cartridge assembly is operatively positioned within said housing.

Re. 31,966

MULTIPLE FILTER VESSEL

Donald A. Sillers, Jr., Dallas, Tex., assignor to Peerless Manufacturing Company, Dallas, Tex.

Original No. 4,298,474, dated Nov. 3, 1981, Ser. No. 103,857, Dec. 14, 1979. Application for reissue Jun. 11, 1984, Ser. No. 619,365

Int. Cl.[3] **B01D** *46/00*

U.S. Cl. 210—238 **38 Claims**

1. A filter vessel comprising:

a longitudinal vessel body having forward and rearward ends;

an inlet port in said vessel body for admitting fluid to be filtered;

an outlet port in said vessel body for discharging filtered fluid;

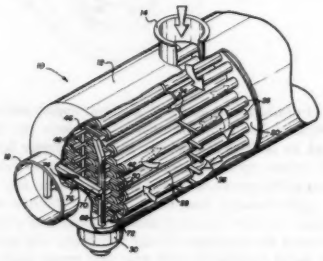
an access port in said forward end of said vessel which is smaller in diameter than said vessel and large enough to permit passage of the arm of a person therethrough;

a plurality of horizontally disposed longitudinal elongated filter elements having an enclosing peripheral wall and forward and rearward ends positioned intermediate said inlet and outlet ports for filtering said fluid; [and]

mounting means, for mounting said filter elements longitudinally and horizontally within said vessel body proximate said forward end such that one or more of said filter elements is non-aligned with said access port, said mounting means comprising;

(a) support means for said forward end of said filter elements positions sufficiently close to the access port in the forward end of said vessel to permit placement and removal of the filter elements by a person whose body remains outside the vessel, and,

(b) locking means for allowing lateral movement of said filter elements in an unlocked mode and for retaining said filter elements in a horizontally disposed position



intermediate said inlet and outlet ports in a locked mode;

said filter elements further comprising forward and rearward ends and wherein said forward ends of said filter elements are proximate said forward end of said vessel body and longitudinally spaced therefrom by a distance which is less than the longitudinal length of said filter elements;

a cap sealingly attached to and closing said forward ends, said cap having a pointed stud extending therefrom which can be grasped by a human hand to manipulate the filter element to which said cap is attached and to support said forward end of said filter element with said support means; and

a plurality of annular reception fittings mounted within said vessel body rearwardly of said filter elements and communicating with said outlet port, and wherein said filter elements are tubular members closed at said forward ends thereof and open at said rearward ends thereof, said mounting means in said locked mode mounting said filter elements in longitudinal alignment with and said open rearward ends thereof in sealing engagement with respective annular reception fittings.

PLANT PATENTS

GRANTED AUGUST 6, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,527
AFRICAN VIOLET PLANT NAMED SLEEPING BEAUTY

Arnold Fischer, Hanover, Fed. Rep. of Germany, assignor to Pan American Plant Company, Parrish, Fla.

Filed Oct. 7, 1983, Ser. No. 539,828
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet plant named Sleeping Beauty, as described and illustrated, and particularly characterized by its large white, slightly ruffled flowers; compact rosette habit, with the flowers being carried on erect peduncles; floriferous habit, and its medium-light green foliage.

5,528
CARNATION NAMED LONDESTY

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, Antibes, France

Filed Jul. 11, 1983, Ser. No. 512,730
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct carnation cultivar, substantially as herein shown and described, characterized by the very light yellow and white coloration of its medium sized blooms which are carried on long, straight, stiff stems; and by its advantageous growth habit and abundant production of flowers during its blooming seasons.

5,529
CARNATION NAMED STANARTHUR

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij/M. C. van Staaveren, Aalsmeer, Netherlands

Filed Nov. 30, 1983, Ser. No. 556,613
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct carnation variety, substantially as herein shown and described, characterized by its continuous production of medium sized blooms of almost white color variegated by longitudinal stripes appearing at the outer ends of most of its petals and its apparent resistance to *Fusarium oxysporum.*

5,530
CARNATION NAMED LONDAXIE

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de la Londe, Antibes, France

Filed Jul. 11, 1983, Ser. No. 512,884
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—71 **1 Claim**

1. A new and distinctive carnation cultivar, substantially as herein shown and described, characterized by the unique coloration of its medium sized blooms and its abundant production of flowers during each of its recurrent blooming seasons.

5,531
CHRYSANTHEMUM PLANT NAMED POWERHOUSE

Leonard Shoesmith, deceased, late of Westfield, England (by May V. Shoesmith, executrix), assignor to Pan American Plant Company, Parrish, Fla.

Filed Aug. 18, 1983, Ser. No. 524,348
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant named Powerhouse, as described and illustrated, and particularly characterized by its flat capitulum form and decorative capitulum type; white ray floret color; diameter of 70–100 mm. across face of the capitulum; medium pot plant height and compact growth habit; semi-upright branching pattern, and approximately nine week flowering time.

PATENTS

GRANTED AUG. 6, 1985

ERRATA

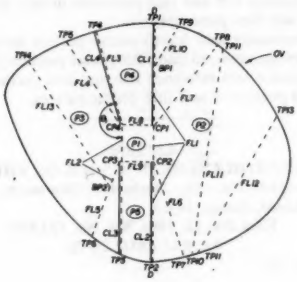
For CLASS	See PATENT NO.
623–002	4,532,659
623–018	4,532,660
623–023	4,532,661
403–028	4,532,681
356–073	4,532,723
172–266	4,532,790
119–004	4,532,883
132–007	4,532,950
181–280	4,533,015
546–008	4,533,502
427–372	4,533,524
428–469	4,533,525
514–054	4,533,548
514–056	4,533,549
514–256	4,533,550
514–411	4,533,551
514–460	4,533,553
514–464	4,533,554
514–303	4,533,734

PATENTS

GRANTED AUGUST 6, 1985

GENERAL AND MECHANICAL

4,532,653
BASEBALL GLOVE
Peter Riaboff, 403 25th Ave., San Francisco, Calif. 94121
Filed Feb. 21, 1984, Ser. No. 581,861
Int. Cl.³ A41D *13/10, 19/02*
U.S. Cl. 2—19 **14 Claims**



1. A method of making a paperboard sheet foldable to form a cavity for catching a baseball from a sheet of paperboard, the method comprising the steps of:

cutting a generally ovular blank having a maximum diameter of at least 25 cm. from the sheet of paperboard;

making a first fold line along a diameter line across the ovular blank, with the diameter line thus defining a left half oval, a right half oval, a left half circumference and right half circumference;

making a first cut along the diameter line from it's first termination point on the circumference of the blank inward for a length of substantially 45% of the length of the diameter ine to a first cut point, with this cut defining a first cut line;

making a second cut along the diameter line from it's second termination point on the circumference of the blank inward for a length of substantially 40% of the length of the diameter line to a second cut point, with this cut defining a second cut line;

making a second fold line along a line lying in the left half oval and being parallel to the diameter line and spaced apart from the diameter line by substantially 3 cm., with the length of the second fold line being substantially 55% of the length of the first fold line, with one end of the second fold line terminating on the left half circumference at a point adjacent to, but spaced apart substantially 3 cm. from the second termination point of the first fold line, and the other end of the second fold line terminating in the left half oval at a fourth cut point;

making a third cut along the second fold line from its termination point on the left half circumference to a third cut point, with this cut defining a third cut line where the length of the third cut line is substantially equal to the length of the second cut line;

making a third fold line from the fourth cut point to the left half circumference along a line oriented rightward a first angle (θ_1), of substantially 170° away from the second fold line;

making a fourth cut along the third fold line from the fourth cut point to the left half circumference; thus defining a fourth cut line

making a fourth fold line from the fourth cut point to a termination point on the left half circumference along a line oriented leftward at a second angle (θ_2) of substantially 18° away from the third fold line;

making a fifth fold line from the third cut point to a termination point on the left half circumference along a line oriented rightward at a third angle (θ_3) of substantially 10° away from the second fold line;

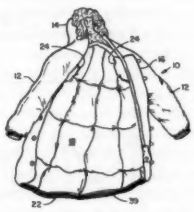
making a sixth fold line from the second cut point to a termination point on the right half circumference along a line oriented leftward at a fourth angle (θ_4) of substantially 13° away from the second cut line;

making a seventh fold line from the first cut point to the right half circumference along a line oriented rightward at a fifth angle (θ_5) of substantially 32° away from the first cut line;

making an eighth fold line from the first cut point to the fourth cut point; and

making a ninth fold line from the second cut point to the third cut point.

4,532,654
BLIZZARDKOAT
Michael Sigismonde, Sound Beach, N.Y., assignor to Christopher B. Guzowski, Mt. Sinai, N.Y., a part interest
Filed Jun. 4, 1984, Ser. No. 616,806
Int. Cl.³ A41D *23/00*
U.S. Cl. 2—69.5 **5 Claims**



1. In an insulated jacket having a front opening and sleeves, and means to close and unclose said front opening about the upper body portion of the wearer of said jacket, the improvement comprising an insulated lining attached along the bottom edge of said jacket and normally extending up the inside of said jacket, said lining having openings to correspond with the openings into said sleeves, means to maintain during normal wear of said jacket said lining in its upwardly extending position, and means on said lining when the latter is pulled out of said jacket to extend away from the latter to wrap around the legs of said wearer and to maintain said lining in its wrapped position around said legs.

4,532,655
METHOD OF GENERATING A PATTERN OF A FLAT SEAM GARMENT
Philip N. Bowditch, Cohasset, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Division of Ser. No. 500,080, Jun. 1, 1983, Pat. No. 4,510,626.
This application Dec. 27, 1983, Ser. No. 565,377
Int. Cl.³ A41D *27/00*
U.S. Cl. 2—243 B **2 Claims**

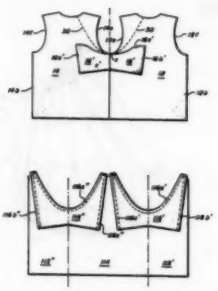
1. Method for converting a pattern for a first garment to a pattern for a second garment, wherein

said first garment includes front and back body and shoulder portions with a shoulder hole between those front and back portions, and a separate, generally tubular sleeve portion having a sleeve seam extending along its length, one end of said sleeve portion being joined to the perimeter of said shoulder hole along a sleeve-to-shoulder seam whereby the regions of said sleeve portion adjacent to said

sleeve-to-shoulder seam are non-parallel with respect to regions of said body and shoulder portions adjacent to said sleeve-to-shoulder seam when said body and shoulder portions are positioned in a plane, wherein,

said first garment pattern includes at least one first planar pattern corresponding to said front and back body and shoulder portions positioned in a plane and a second planar pattern corresponding to said sleeve portion positioned in a plane without its sleeve seam being joined, and wherein

said second garment includes body portions including front and back body portions with a shoulder hole between those front and back body portons, and a separate, generally tubular sleeve and shoulder portion having a sleeve and shoulder seam extending along its length, one end of said sleeve and shoulder portion being joined to the perimeter of said shoulder hole along a shoulder-to-body seam, and wherein the regions of said body portions adjacent to said shoulder-to-body seam are substantially parallel to the regions of said shoulder and sleeve portion adjacent to said shoulder-to-body seam when said regions of said body portion adjacent to said sleeve-to-shoulder seam is positioned in a plane without the sleeve and shoulder seam being joined, and wherein the regions of the said body portions adjacent to said sleeve-to-shoulder seam are



non-parallel with respect to the regions of said shoulder and sleeve portion adjacent to said sleeve-to-shoulder seam when said regions of said body portions adjacent to the said sleeve-to-shoulder seam are positioned in a plane with said sleeve and shoulder seam being joined, wherein

said second garment pattern includes at least one third planar pattern corresponding to said front and back body portions positioned in a plane and a fourth planar pattern corresponding to said sleeve and shoulder portion positioned in a plane without its sleeve and shoulder seam joined, wherein the outer contour of said first garment is substantially the same as the outer contour of said second garment, comprising the steps of:

A. generating a fifth planar pattern from said second planar patter, said fifth planar pattern corresponding to said sleeve portion wherein the sleeve seam of said sleeve portion is adapted to extend from the uppermost point of said shoulder hole, said fifth planar pattern including an end portion having a perimeter corresponding to the perimeter of said sleeve hole,

B. overlaying said fifth planar pattern on said first planar pattern with the center point of said perimeter of said end portion of said fifth planar pattern being positioned for its joinder to the lowermost point of said perimeter of said shoulder hole portion of said first planar pattern, said first and fifth patterns lying in substantially parallel planes,

C. identifying a reference line in the plane of said first planar pattern, said reference line being defined by the mid-points of line segments connecting pairs of associated points on said perimeter of said end portion of said fifth pattern of pattern and said perimeter of said shoulder hole of said first pattern, the distances from the points in each pair of associated points from a respective one of said lowermost and center points being a relatively fixed ratio, said distances being measured along the contours defined by said perimeter of said shoulder hole of said first pattern and said perimeter of said end portion of said fifth pattern, respectively,

D. generating said third planar pattern having areas corresponding to said first patterns less the area between said reference line and said perimeter of said shoulder hole of said first planar pattern,

E. generating said fourth planar pattern having an area corresponding to said fifth planar pattern plus the area between said reference line and said perimeter of said end portion of said fifth planar pattern.

4,532,656

POCKET STRUCTURE IN A SOCK OR THE LIKE

Tokuo Suzuki, No. 91, Norborito Shin-machi, Tama-ku, Kawasaki-shi, Kanag, Japan

Filed Jul. 11, 1983, Ser. No. 512,599
Int. Cl.³ A41D *27/20*
U.S. Cl. 2—247 **2 Claims**

1. A pocket structure for a garment, comprising:

a strip, said strip having first and second portions, said first portion having a rear surface for attachment to a garment and a front surface, said second portion having a rear surface and a front surface, said front surface of the first portion including a first binding means, said front surface of the second portion including a second binding means, said first and second binding means being releasably bindable to each other upon folding the front surface of the second portion over the front surface of the (second) first portion; a pocket, said pocket including a rear portion having a first area and a second area, said first area including a third binding means for releasably binding the first area to the first binding means of the strip, said second area including a fourth binding means for releasably binding the second area to the second binding means of the strip, whereby the pocket is releasably bound to a strip on (a) the garment, and upon removal of the pocket, the front surface of the second portion of the strip may be folded over the front surface of the first portion of the strip and releasably bound thereto.

4,532,657

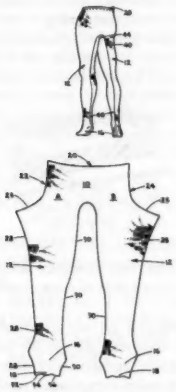
ONE-PIECE TIGHTS-TYPE GARMENT

Nadine Revene, New York, N.Y., assignor to Aris Isotoner Gloves, Inc., New York, N.Y.

Filed May 21, 1984, Ser. No. 612,552
Int. Cl.³ A41B *9/04*
U.S. Cl. 2—409 **10 Claims**

1. A tights-type garment comprising a single fabric blank defining a trunk portion and a pair of elongated depending portions, said trunk portion including a relatively straight edge defining a waist section for encircling the waist of a wearer, each of said pair of elongated depending portions including a

leg section and a foot section having a toe portion, said leg and foot sections of each of said pair of elongated depending portions having edges joined together by a first seam, said first seam extending from the toe portion of one foot section, along



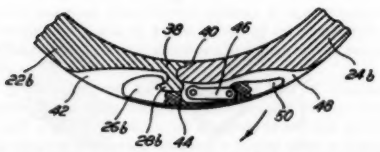
the leg section to the juncture of said trunk portion with said elongated depending portions, and to the toe portion of the other foot section, said trunk portion including edges secured together by a second seam extending from said waist section to said first seam.

4,532,658

PROTECTIVE HELMET FOR THE HEAD WITH LOCKING MEANS

Gianni Zago, Pordenone, Italy, assignor to Patents Engineering S.r.l., Pordenone, Italy

Filed Nov. 12, 1981, Ser. No. 320,575
Claims priority, application Italy, Nov. 19, 1980, 60475/80[U]
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—421 **5 Claims**



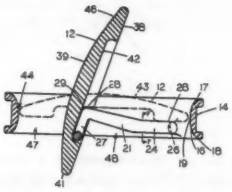
1. Integral helmet having a cap and a front bottom opening which is provided with two arched complementary segments engagable with the neck of the wearer and which are pivotable so that the helmet is free to pass over the head of the wearer when the segments are not engaged, said two arched segments which complete the bottom opening of the helmet being connected to the cap of the helmet only at ends hinged to the cap of the helmet by vertical axes hinges while the other ends of said arched segments are provided with joining detachable members for the opening of said segments during the removal and/or the putting on of the helmet, said members holding said segments engagable when the helmet is on.

4,532,659

PROSTHETIC HEART VALVE WITH PLANO-CONVEX DISK OCCLUDER

Robert L. Kaster, Plymouth, Minn., assignor to Angicor Limited, Minneapolis, Minn.

Continuation-in-part of Ser. No. 415,283, Sep. 7, 1982, abandoned. This application Jan. 9, 1984, Ser. No. 568,944
Int. Cl.³ A61F *1/22*
U.S. Cl. 623—2 **15 Claims**



1. In a prosthetic heart valve of a type having a valve housing adapted to be attached to a blood carrying vessel; a passageway disposed through said housing for permitting blood to flow therethrough, said passageway having a proximal inlet side and a distal outlet side; disk occluder means disposed within said passageway in the valve housing for permitting the flow of blood from the proximal inlet side of the passageway to the distal outlet side of the passageway and for substantially preventing the flow of blood from the distal outlet side to the proximal inlet side of the passageway, said disk occluder means including a disk disposed within said passageway, said disk having an outer peripheral edge, a proximal side and a distal side; means for causing said disk to be free floating and rotatably disposed within said passageway for preventing wear thereof, and means associated with said housing for causing said disk to be pivotable within said passageway between a closed position wherein the outer peripheral edge is in close proximity to the passageway and an open position wherein a substantial portion of said peripheral edge is spaced from said passageway to permit flow through said passageway; the improvement comprising:

(a) a substantially planar surface on the proximal inlet side of said disk, said planar surface being located radially inwardly from said outer peripheral edge; and

(b) a concentrically disposed well formed in said planar surface, the area of said well comprising no more than approximately thirty-six percent of the total area of said proximal side of said disk whereby the position of the disk can be controlled.

4,532,660

ENDOPROSTHETIC BONE JOINT DEVICES

Richard E. Field, Near Masham, England, assignor to National Research Development Corporation, London, England

Filed May 17, 1983, Ser. No. 495,553
Claims priority, application United Kingdom, May 17, 1982, 8214347
Int. Cl.³ A61F *1/00*
U.S. Cl. 623—18 **12 Claims**

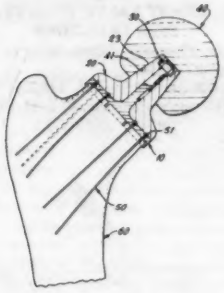
1. An endoprosthetic bone joint device comprising:

a first part defining a support surface to engage a complementery surface of a bone of said joint, said first part having a plurality of longitudinal transverse passageways extending completely through said support surface;

a second part defining an articulation surface for said joint,

said second part being connectable with said first part remotely from said support surface;

and a multiplicity of transversely flexible filamentary elements, each said element having a diameter in the range 0.25 to 2.0 mm and a length of at leas 3 cm, and each said



element having an enlargement at one end thereof captively located between said first and second parts with the remainder of such element passing through a respective one of said passageways to project from said support surface into said bone thereby anchoring said bone joint device to said complementary surface of said joint.

4,532,661

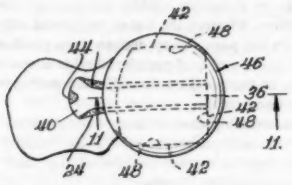
FEMORAL HEAD REMODELING AND PROSTHETIC MEANS THEREFOR

Alan A. Halpern, 2830 Duke St., Kalamazoo, Mich. 49008

Filed May 7, 1982, Ser. No. 376,111

Int. Cl.³ A61F *1/04, 5/04*

U.S. Cl. 623—23 **44 Claims**



1. A femoral insert, adapted to be secured in a femoral shank as a part of a femoral hip joint replacement, comprising an elongated shaft with a longitudinal axis generally corresponding to the vertical axis of a femoral shank, said insert comprising a stem portion, a neck portion, and a head portion constituting an offset to the longitudinal axis of said shaft, said stem, neck, and head portions being both solid and integral, said head portion having a cross-section when viewed from its top of the nature of an elongated rectangle, to permit seating thereof between two vertically-upstanding portions of a remodeled femoral head having an opening therebetween generally corresponding to the cross-section of said head portion, and including a femoral cap on said head portion, wherein said shaft is flanged along at least a lower portion thereof and wherein a groove is formed on a posterior surface of said shaft along its longitudinal axis, so as to permit three-point contact of said shaft with the interior cortex of said femoral shank when said flanged portion is in place therein.

4,532,662

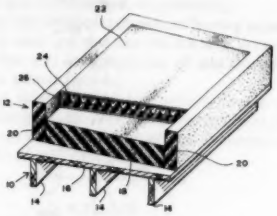
MODIFIED WATERBED

Nicholas Sama, 19120 Bel Aire Dr., Miami, Fla. 33157

Filed Dec. 27, 1983, Ser. No. 565,706

Int. Cl.³ A47C *27/08*

U.S. Cl. 5—450 **18 Claims**



1. A modified waterbed assembly adapted to diminish the physiological sensations that are associated with "bottoming" comprising:

a bladder impermeable to, and for containing, a liquid;

a resilient insert disposed within the bladder and having a vertical dimension substantially identical to that of the bladder, which insert comprises a resiliently compressible, elastic material porous as to the liquid, said insert having, as a property, firmness characteristics defined as displacement force divided by penetration depth

a resilient base disposed at least in part beneath the bladder and comprising a resiliently compressible, elastic material, with firmness characteristics defined as displacement force divided by penetration depth, that is substantially identical to the firmness characteristics of the resilient insert whereby displacement across a boundary between the insert and the base cannot be physiologically perceived;

said insert and base providing substantially all of the support to a user of the waterbed assembly while the liquid substantially serves only as a load distribution means; the thickness of the bladder being no more than approximately three inches and the thickness of the base being about four inches.

4,532,663

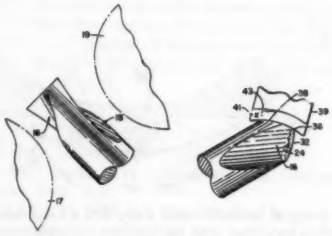
METHOD OF MANUFACTURING A DRILL SCREW

Henry A. Sygnator, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Division of Ser. No. 279,103, Jun. 30, 1981, Pat. No. 4,395,173. This application Jul. 14, 1983, Ser. No. 513,582

Int. Cl.³ B23G *9/00*; B21K *1/56*

U.S. Cl. 10—10 R **5 Claims**



1. A method of manufacturing a drill screw having a pair of oppositely disposed flutes and a pair of oppositely disposed terminal end surfaces, said end surfaces intersecting to form a chisel, each end surface being bounded by a drag edge and a

cutting edge, said method comprising the steps of heading a first end of a screw blank; forming two flutes in a second end of said screw blank; milling a first terminal end surface on said second end by rotating peripheral teeth of a milling cutter in a direction from a first drag edge toward a first cutting edge formed at the intersection of a first of said two flutes and said first terminal end surface; milling a second terminal end surface on said second end by rotating peripheral teeth of a milling cutter in a direction from a second drag edge toward a second cutting edge formed at the intersection of a second of said two flutes with said second terminal end surface; leaving first and second burrs positioned along outer portions of said first and second cutting edges at positions spaced from said chisel; performing subsequent operations on said drill screw.

4,532,664

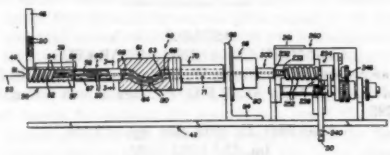
FASTENER ORIENTING, TAPPING AND COLLECTION SYSTEM

John H. Steward, Bloomfield Hills, and Harold A. Ladouceur, Livonia, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 395,410, Jul. 6, 1982, Pat. No. 4,476,599, which is a division of Ser. No. 151,549, May 20, 1980, Pat. No. 4,338,694. This application Mar. 29, 1984, Ser. No. 640,418

Int. Cl.³ B23G *11/00*

U.S. Cl. 10—162 A **7 Claims**



1. In a continuous motion machine for orienting nuts, each nut havng a body portion with generally rectangular top and bottom faces and a pair of oppositely extending flange portions such that one flange portion extends from each end of the nut, each nut including a pair of opposed sides, and a central bore extending through each nut body portion with the bore axis generally perpendicular to the top and bottom faces, the combination comprising:

conveyor means advancing nuts in substantially continuous succession on an established feed path with the nuts aligned in face-to-face abuttment with each nut bore slidably received on rod means being aligned on the feed path and with the nuts in random angular orientation;

orienting means having passage means receiving the nuts aligned on said rod means sized such that each nut is free to rotate in said passage means about its bore axis, with each nut bore axis being maintained in coincidence with the feed path as it is being advanced through said passage means;

said orienting means having a first pair of diagonally opposed camming means in said passage means successively engaging each nut of a first group of the randomly oriented nuts and rotating same in a first direction to an initial first predetermined oblique angle;

said orienting means having a second pair of diagonally opposed camming means in said passage means successively engaging each nut of a second remaining group of the randomly oriented nuts and rotating same in a second direction to an initial second predetermined oblique angle complementary to said first predetermined oblique angle; and

said orienting means having a third pair of opposed camming means successively engaging each nut of the first group of nuts and rotating same about the feed path in the first direction from said first oblique angle, whereby each first group nut is successively advanced from said orienting means with its sides disposed, respectively, in a given pair of parallel planes;

and said third pair of opposed camming means successively engaging each nut of the second group of nuts and rotating same about the feed path in the second direction from said second oblique angle, whereby each second portion nut is successfully advanced from said orienting means on said rod means with its sides disposed, respectively, in said given pair of parallel planes.

4,532,665

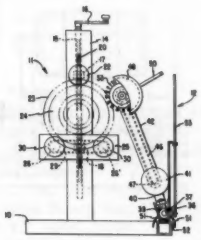
WHEEL RIM BUFFING DEVICE

Maurice L. Evans, 1401 Peninah; Clark M. Mola, 500 E. 21st St., both of Yankton, S. Dak. 57078, and Richard D. Beringer, 417 N. Pearl, Tyndall, S. Dak. 57066

Filed Mar. 26, 1984, Ser. No. 593,645

Int. Cl.³ A46B *13/02*

U.S. Cl. 15—21 D **10 Claims**



1. Rim buffing means comprising a base, rim holding means mounted on said base, said rim holding means including a substantially vertical column, at least two sheave means slidably mounted on said column, means to move said sheave means slidably toward and away from each other, said sheave means adapted to engage and hold a rim, drive means adapted to drive at least one of said sheave means to cause said rim to rotate, and buffer means on said base adjacent said rim holding means and including a driven buffer wheel adapted to engage said rim to clean it.

4,532,666

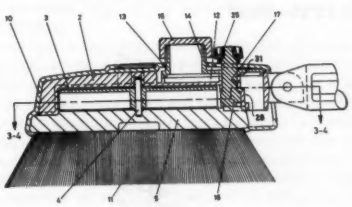
BRUSH WITH DETERGENT FEED

Donald N. Smyth, South Plympton, Australia, assignor to Sabco Limited, Albert Park, Australia

Filed Mar. 22, 1983, Ser. No. 478,067

Int. Cl.³ A46B *13/06*

U.S. Cl. 15—22 R **3 Claims**



1. Means for adding a supply of detergent to a flow of fluid over a surface of a housing, characterised in that said means comprises a detergent tank supported by said housing and situated adjacent said surface, a bore in said housing parallel to said surface and opening into said surface, a rotatable valve element in said bore and having a blade adapted to be positioned in said opening, said valve element having axial passages connecting to each side of said blade, whereby said blade

element interrupts said flow to form a vortice on each side of said blade which causes fluid to flow up one axial passage into said tank to be mixed with said detergent and be dispensed down said other axial passage into the fluid flow over the surface.

4,532,667

FLOOR CLEANING DEVICE HAVING A REPLACEABLE BRUSH ASSEMBLY

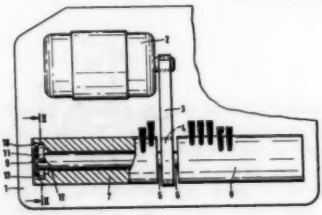
Heinrich Komesker, Wuppertal, and Ludger Helmes, Velbert, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,401

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1983, 3332743

Int. Cl.³ A47L *11/18*

U.S. Cl. 15—49 C **8 Claims**



1. A replaceable brush assembly for a floor cleaning device such as an electric carpet sweeper having a drive for rotatably driving a shaft for receiving the replaceable brush assembly thereon, the replaceable brush assembly comprising:

a tubular brush defining an elongated opening for accommodating the shaft therein when the brush assembly is placed thereon;

ring-shaped cavity means formed in said tubular brush in surrounding relation to said shaft; and,

coupling-decoupling means arranged in said cavity means for coupling said tubular brush to said shaft during normal operation of the floor cleaning device and for decoupling said tubular brush in response to an overload condition applied to the latter.

4,532,668

FOOT SCRUBBER WITH SOAP DISPENSER FOR USER WHO CANNOT REACH HIS FEET

Alex Slonicki, 1050 Tower Rd., Winnetka, Ill. 60093

Filed Oct. 24, 1983, Ser. No. 544,532

Int. Cl.³ A47K *7/00*

U.S. Cl. 15—104.92 **11 Claims**

1. A foot scrubber comprising:

(a) a frame comprising two substantially parallel sidewalls and a bottom plate supporting said sidewalls;

(b) support means mounted on said sidewalls;

(c) scrubbing means arranged on said bottom plate and on said sidewalls;

(d) a first suction means mounted on said bottom plate for affixing said frame to a surface by suction;

(e) compressible storage means removably mounted on said support means for storing liquid soap, having an outlet directed for dispensing liquid soap onto said bottom plate only in response to the application of pressure on said compressible means;

(f) linearly displaceable pressing means arranged to apply pressure on said compressible storage means by downward displacement;

(g) manually operable means including a handle rigidly connected to a shaft, said manually operable means being rotatable about and displaceable along the axis of said shaft; and

(h) guiding means for guiding said pressing means and said manually operable means during displacement, wherein said manually operable means has recesses formed therein, and said pressing means and said guiding means each have engaging means formed thereon for engaging said recesses, said recesses being arranged so that said pressing means are displaced downward during downward displacement of said manually operable means, said manually operable means being displaceable downward only when said handle is in a predetermined angular position with respect to said guiding means.

4,532,669

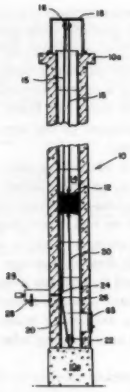
CHIMNEY CLEANING APPARATUS

Wilfred J. Desjardins; Wayne W. Desjardins, and Glen R. Desjardins, all of Main St., R.F.D. #1, Box 2, Van Buren, Me. 04785

Filed May 23, 1984, Ser. No. 613,168

Int. Cl.³ F23J *3/00*

U.S. Cl. 15—249 **20 Claims**



1. Apparatus installed in a chimney for cleaning a flue of the chimney by manual or automatic operation comprising:

a flue brush seated in the flue of the chimney;

a first flexible cable secured to the top of the brush;

a second flexible cable secured to the bottom of the brush;

first pulley means mounted above the top of the chimney for reversing the direction of the first cable, said first cable extending upward from the top of the brush through the flue to the top of the chimney, over the first pulley means and back down the flue;

second pulley means mounted in the flue at the base of the chimney, said second cable extending downward from the bottom of the brush through the flue to the base of the

chimney, around the second pulley means and back up the flue;

a control box mounted on the outside of the chimney and constructed and arranged for fitting over first and second holes to be formed through the side of the chimney extending from said control box to the inside of the flue;

first guide means constructed and arranged to be mounted in the first hole extending into the flue for guiding the first cable passing back down the flue with reduced friction into the control box;

second guide means constructed and arranged to be mounted in the second hole extending into the flue for guiding the second cable passing back up the flue with reduced friction into the control box;

said control box comprising a crank shaft with at least first and second reels mounted on the crank shaft for free wheeling of the first and second reels on the shaft, clutch means constructed and arranged for engaging the shaft with either the first or second reel for rotation of either the first or second reel with the shaft while the other reel is free wheeling and clutch actuating means;

said first cable constructed and arranged for passing back down the flue through the first guide means to the first reel, said first cable secured at its end to the reel with sufficient length stored on the reel to permit the flue brush to pass through the flue from the base of the chimney to the top of the chimney;

said second cable constructed and arranged for passing back up the flue through the second guide means to the second reel, said second cable secured at its end to the second reel with sufficient length stored on the reel for passage of the chimney flue brush through the length of the flue from the base of the chimney to the top of the chimney;

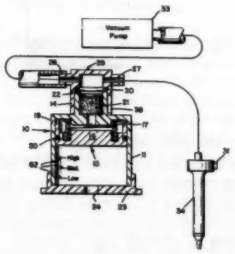
and means for turning the control box crank shaft while actuating the clutch means to engage either the first or second reel for pulling the chimney flue brush either up the chimney or down the chimney, said first and second reels therefore turning in opposite directions on the crank shaft during cleaning of the chimney flue.

4,532,670

VACUUM BOOSTER AND FILTER

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

Filed Jan. 31, 1983, Ser. No. 462,650
Int. Cl.³ A47L *5/38*
U.S. Cl. 15—314 **10 Claims**



7. A vacuum booster and filter system comprising:

(a) a plurality of vacuum boosters, each including a manifold having four nipples for connection to a vacuum source and at least one vacuum-operated desoldering instrument, each booster comprising:

(b) a relatively large hollow cylinder and a relatively small cylindrical neck of unitary construction, said manifold having a skirt extending over said neck;

(c) filter means disposed in said neck, said cylinder and neck being transparent and said skirt being opaque;

(d) a window disposed in said skirt to permit viewing of said filter means;

(e) a piston slidably arranged in said cylinder and being sealed with respect thereto;

(f) a base connected outwardly of said cylinder for supporting it and disposed opposite said manifold, said base having an opening communicating with the atmosphere to permit air between said piston and said base to escape; and

(g) a compression spring urging said piston toward said base; said system further including:

(h) a vacuum source connected to all of said boosters through at least one of said nipples of each booster;

(i) at least two vacuum-operated utilization devices connected to at least two of the nipples of each of said boosters;

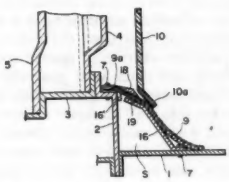
whereby a vacuum applied by the vacuum source tends to pull said piston against the force of said spring toward said manifold.

4,532,671

RESILIENT STRUCTURE FOR SECURING CARPETING OF DIFFERENT THICKNESSES

Toshio Endo, Koshigaya, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 11, 1983, Ser. No. 512,563
Claims priority, application Japan, Aug. 25, 1982, 57-146184
Int. Cl.³ A47G *27/04*
U.S. Cl. 16—7 **6 Claims**



1. A structure for attaching floor carpeting to a vehicle body, the vehicle body including a floor panel, a side sill inner panel, the lower edge of which is attached to one edge of the floor panel, a side sill outer panel, one upper edge of which is attached to an upper edge of the side sill inner panel and the lower edge of which is attached to a lower edge of the side sill inner panel, a pillar inner member, the lower edge of which is attached to an upper edge of the side sill outer panel, the structure comprising:

(a) a carpet support member located below the pillar inner member and serving as a substrate for a layer of the floor carpeting, a first edge of which is attached to the upper end of the side sill inner panel and the other edge of which is attached to the floor panel to form a space of a substantially triangular cross-section in conjunction with the side sill inner panel and the floor panel, said carpet support member having a substantially trapezoidal cutout edged with a plurality of resilient structural members and located along the first edge at a point opposite the lower end of the pillar inner member; and

(b) a pillar casing mounted on the pillar inner member such that the lower end thereof compresses the floor carpeting against the edges of said cutout, whereby said plurality of resiliently structural members flex into the space of substantially triangular cross-section when the lower end of said pillar casing compresses the floor carpeting against the edges of said trapezoidal cutout to thereby reduce the

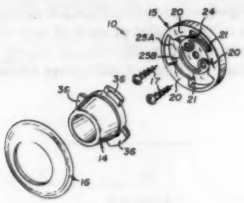
reactive force of the floor carpeting against the pillar casing so that the floor carpeting of nearly any thickness can be secured.

4,532,672

DOORSTOP HAVING BAYONET ENGAGEABLE BRACKET AND SEPARATELY MOUNTED SHIELD

William J. Anderson, Taylorsville, Miss., assignor to Enamel Products & Plating Co, McKeesport, Pa.

Filed May 23, 1984, Ser. No. 613,331
Int. Cl.[3] E05F 5/06
U.S. Cl. 16—86 A 7 Claims



1. A wall mountable doorstop comprising a disc-shaped bracket having a base and circumferential side wall extending therefrom, the base including wall mounting means and a concentric ridge spaced inwardly of said side wall and forming a circular channel therewith, said side wall having a plurality of evenly spaced-apart and inwardly directed flanges extending over said channel, a resilient bumper having a cup-shaped front portion and a bracket-engageable rear portion having an outer wall spaced from a central core to form an annular cavity therewith, the outer wall terminating in a rear edge having an internal diameter no less than the concentric ridge of the bracket, a plurality of evenly spaced-apart tabs extending outwardly from said outer wall generally adjacent the rear edge thereof, said tabs defining an outside diameter no greater than the bracket side wall diameter whereby to be capable of being arranged within said circular channel of the bracket so that upon rotating said bumper said tabs wedge beneath said bracket flanges, said outer wall further including an external continuous groove therearound, and, a bracket-concealing cover shield having a circular opening therethrough with an internal edge thereof having a diameter sufficient for said edge to engage within the continuous groove whereby the cover shield is adapted to be solely supported and carried by said bumper, wherein the bracket wall mounting means facilitates a mechanical fastening of the bracket to a wall independently of said cover shield, and wherein the bumper is engageable directly to the bracket and separately engageable directly with the cover shield, said cover shield thereby capable of being secured to and carried by the bumper and adapted to be arranged to conceal the bracket after said bracket is mounted to a wall, whereby the improved doorstop eliminates separate mechanical fastener means for mounting the bumper with the bracket and for engaging the bumper with the cover shield.

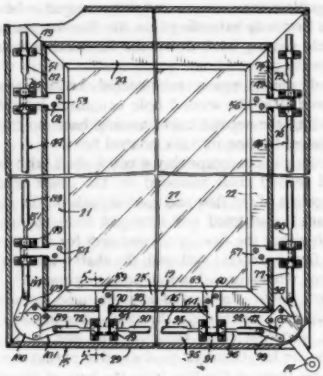
4,532,673

PIVOT MECHANISM FOR MULTIPLE AXES OPENING WINDOW OR CLOSURE

Sam K. Kim, 2516 W. Pratt Blvd., Chicago, Ill. 60645

Filed Aug. 5, 1983, Ser. No. 520,542
Int. Cl.[3] E05D 15/524
U.S. Cl. 16—233 11 Claims

1. In a hinge and locking mechanism for a generally rectangular closure member that may be opened by pivotal movement about at least two axes, a stationary generally rectangular frame member surrounding and supporting the closure member, hinge means on each of the axes mounted on one of the members, the improvement comprising; two spaced hinges on each of said axes on one of said members, two spaced pivot pins on each of the axes mounted on the other of said members selectively positionable in each of the hinges to define pivot axes for the closure member when the pins are in the hinges, and a common operator for all of the pins, said pivot pins on



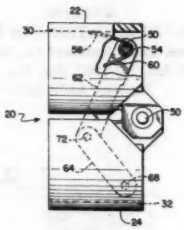
each axis being formed integrally and coaxially with an actuator rod connected to the common operator, said pivot pins being shiftable axially to a position freeing the hinges from the pivot pins without shifting the closure member laterally in the plane of the closure member.

4,532,674

HINGE ASSEMBLY WITH OVER-CENTER LATCH

William H. Tobey, Littleton; Donald A. Thomas, Englewood, and William J. Gardner, Littleton, all of Colo., assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Apr. 30, 1982, Ser. No. 373,579
Int. Cl.[3] E05F 1/08
U.S. Cl. 16—295 2 Claims



1. A hinge assembly comprising:

(a) first and second generally cylindrically-shaped sleeves including cutouts near adjacent ends thereof;

(b) first and second U-channels fixedly disposed within said first and said second sleeves, respectively, each U-channel comprising a curved base portion, two substantially straight leg portions, and a tab extending from each leg portion through the cutout in said first or said second sleeve in which said U-channel is disposed, the tabs of said first and said second U-channels being pivotally connected for thereby enabling relative pivotal movement between said first and said second sleeves;

(c) a primary link and two secondary links, each of said primary and said secondary links having flat sides, a small thickness and an elongated length for fitting side-by-side between said leg portions of said second U-channel when

said first and said second sleeves are in an unfolded configuration, said secondary links being disposed parallel to each other each having one end pivotally connected to said second U-channel and the other end pivotally connected to an end of said primary link, the other end of said primary link being pivotally connected to said first U-channel, said primary and said secondary links being sized and arranged for comprising an overcenter latch; and

(d) a torsion spring mounted on said first U-channel, having an arm positioned against said primary link and having a plurality of windings extending between said leg portions of said first U-channel sufficient to provide the spring force necessary for, through the pivotal connections among said primary link, said secondary links and said second U-channel, urging said second sleeve to pivot into said unfolded configuration abutting end-to-end with said first sleeve and also urging said primary link into a position together with said secondary links between said leg portions of said second U-channel and at an angle to said secondary links sufficient to lock said sleeves in said unfolded configuration.

4,532,675

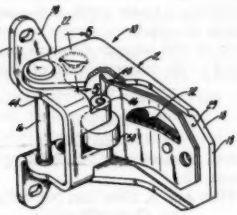
DOOR HINGE WITH INTEGRAL CHECK

Sumorfin Salazar, Toledo, Ohio, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 378,546, May 17, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,221

Int. Cl.³ E05D *11/10*

U.S. Cl. 16—335 **6 Claims**



1. In an improved hinge assembly of the type having a body plate adapted to be secured to the body of a vehicle, a door plate pivotally connected about a vertical hinge axis to the body plate and adapted to be secured to a door of the vehicle, and a check spring mounted on one of the plates operatively engageable with a striker member carried by the other of the plates to hold the door plate in a door-open position, the improvement wherein:

the check spring comprises a curved resilient spring member having an end fixed to said body plate and another, free end located at a position intermediate said body plate and said door plate and proximate the point of pivotal connection of the body plate and the door plate and having a detent portion bent over in a direction away from said striker member at said free end toward said body plate; and

the striker member comprises a roller member rotatably mounted on said door plate about another vertical axis displaced from said vertical hinge axis, said roller member being operative upon movement of said door plate from a door-closed position wherein said roller is spaced from said spring member to said door-open position to engage said spring member in rolling contact to effect deflection thereof until passing over said detent portion, whereupon said roller member is moved completely free of said detent portion and out of contact with said spring member and further away from said detent portion and said spring member during all further movement toward and into said door-open position and reverse movement of said door plate is resisted by said spring member when the roller is moved in the reverse direction into engagement with the detent portion, movement into the door open position is limited by stops formed in the side of the body plate when said stops are abuttingly engaged with edges of the door plate.

4,532,676

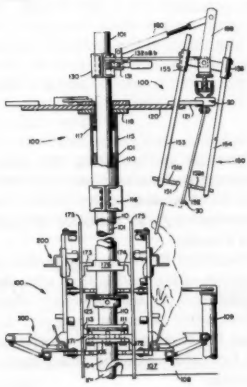
POULTRY OIL SAC REMOVAL METHOD AND APPARATUS

Lacy W. Simmons, 101 Simmons Industrial Blvd., Dallas, Ga. 30132

Continuation-in-part of Ser. No. 873,370, Jan. 30, 1978, abandoned. This application Jul. 16, 1981, Ser. No. 284,087

Int. Cl.³ A22C *21/00*

U.S. Cl. 17—45 **19 Claims**



1. A method of removing the oil sac from a bird in a poultry processing operation, including the steps of:

(a) engaging the bird in such a manner so as to identify the location of the bird's tail section containing the oil sac;

(b) holding the bird's tail section against displacement;

(c) applying pressure to the bird's tail section around the oil sac to cause the oil sac to protrude outwardly, said pressure being applied first in a direction generally away from the bird's head and along a path forming an acute angle with a line drawn generally parallel to the bird's back; and,

(d) engaging a portion of the peripherial edge of the protruding oil sac and effecting displacement of the oil sac while holding the bird's tail section against displacement and while maintaining pressure on the tail section around the sac whereby displacement of the oil sac will cause the oil sac to be effectively removed from said bird.

4,532,677

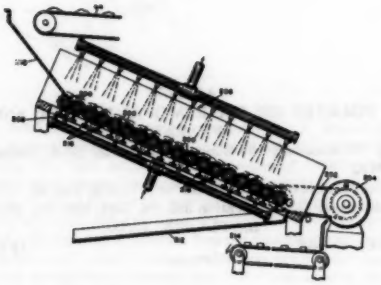
APPARATUS FOR OPENING AND EVISCERATING SCALLOPS

Richard T. Wenstrom, Hampton, Va., and Thomas S. Gorton, Jr., Medford, Mass., assignors to Slade Gorton & Co., Inc., Boston, Mass.

Continuation of Ser. No. 950,711, Oct. 12, 1978, abandoned, which is a continuation of Ser. No. 225,730, Feb. 14, 1973, abandoned, which is a division of Ser. No. 71,730, Sep. 14, 1970, Pat. No. 3,662,432, which is a division of Ser. No. 659,274, Jul. 17, 1967, Pat. No. 3,528,124, which is a continuation-in-part of Ser. No. 627,470, Mar. 31, 1967, abandoned. This application Nov. 23, 1981, Ser. No. 324,270

Int. Cl.³ A22C *29/00*

U.S. Cl. 17—74 3 Claims



1. An aparatus for extracting the adductor muscle from other components of scallops, said apparatus comprising:

(a) means for separating scallop shells from scallop flesh, the flesh comprising the adductor muscles and viscera attached thereto,

(b) an eviscerator for removing the viscera from the adductor muscles of the scallop flesh after the shells have been separated from the scallop flesh by the separating means, said eviscerator having an input end and an output end,

(c) means for transporting the scallop flesh, without the shells, from the separating means to the input end of the eviscerator,

(d) said eviscerator comprising at least one pair of rollers aligned in parallel adjacent relationship to provide a nip between adjacent rollers, each roller in each said pair of rollers having a surface that is roughened so as to facilitate gripping of viscera in the nip between adjacent rollers, said rollers defining a path of travel for the scallop flesh from the input end of said eviscerator to the output end thereof, positive drive means connected to each pair of rollers for nonfrictionally driving each pair of rollers so that the upper portions of said rollers in each pair are alternately (1) rotated towards each other to pinch and pull viscera downwardly through the nip of said rollers and retain the scallop muscles on the upper surface of said rollers, thereby to tear viscera away from the muscles, and (2) rotated away from each other, whereby the viscera are removed from the muscles as the muscles move over the upper surfaces of said rollers from said input end to said output end of said eviscerator.

4,532,678

NEEDLE BAR DRAWING DEVICE

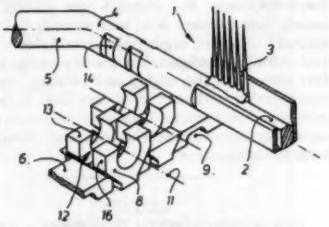
Helmut Kunig, Bad Schwartau, Fed. Rep. of Germany, assignor to S.A. Des Ateliers, Houget Duesberg Bosson, Ensival, Belgium

Filed Jun. 13, 1983, Ser. No. 503,712

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222600

Int. Cl.³ D01G *19/26;* D01H *5/08*

U.S. Cl. 19—129 R 9 Claims



1. A needle bar drawing device (gill box) for card slivers, said device comprising rotatingly driven gilling area means defining two sides and including a plurality of needle bar means, each provided with needle means and carried on both said sides of said gilling area means by flexible driving means, wherein said driving means are designed as standard toothed belt means defining a tooth comb and a pitch and carrying support elements on which said needle bar means are mounted rotatably, each of said support elements being formed to be fixedly clamped to the respective one of said driving means.

4,532,679

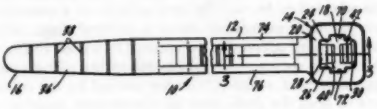
CABLE TIE

William J. Scott, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Jan. 3, 1984, Ser. No. 567,813

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—16 PB 8 Claims



1. An integral one piece cable tie to encircle and be tensioned about a bundle of wires or the like, comprising an elongated flexible strap, ratchet teeth formed on opposite sides of the strap, a frame at one end of the strap and integral therewith, the frame having a channel therethrough disposed on an axis generally at right angles to the free orientation of the strap and having openings on the end faces of the frame, a free end on the strap remote from the frame and constructed to be inserted and drawn through the channel in the frame when the strap is reversely flexed, the channel through the frame being defined at least in part by two longitduinally disposed side walls and two laterally disposed end walls positioned about the axis of the opening, a pair of laterally disposed opposed pawls in the opening integrally formed on the end walls thereof and terminating laterally in sapced relation to the side walls, the pawls being constructed and arranged to engage and interlock with the ratchet teeth on the strap when it is reversely flexed and inserted through the frame channel, each of the pawls being hinged to its end wall toward one of the end faces of the channel and extending axially somewhat toward the other end face, the free side pawl being more flexible than the strap side

pawl, the pawls being formed with opposed abutments spaced apart from each other somewhat less than the minimum strap width the pawls including opposed risers above the abutments which contact the sides of the strap under substantial stress conditions to resist further withdrawal of the strap from the frame.

4,532,680

DOUBLE CLIP FOR OFFICE USE

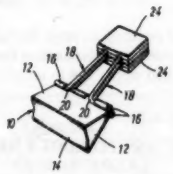
Seiichi Hashimoto, Higashi-Osaka, Japan, assignor to Kabushiki Kaisha Taiyo Hatsujyo Seisakusho, Osaka, Japan

Filed Jul. 20, 1983, Ser. No. 515,569

Claims priority, application Japan, Aug. 6, 1982, 57-119596[U]

Int. Cl.³ B42F *1/02*

U.S. Cl. 24—67 R 3 Claims



1. A double clip for office use comprising a clip main body of metal spring sheet bent into an isosceles triangular cross-section with the base of the triangle forming the back wall of the clip main body, and operating levers of metal wire tiltably and pivotally connected to the clip main body to open the apex of the clip main body against the spring force, wherein a pair of index caps of flexible synthetic resin serving as knobs are removably fitted on the loops at the front end of each lever in such a manner as to resiliently clamp to said end, whereby said index caps provide indicia for indexing.

4,532,681

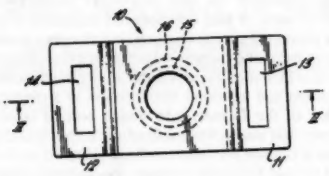
RESTRAINING BELTS

Edward H. Baker, 38 Lowther Rd., Barnes, London SW13 9ND, Great Britain, and George R. King, 14 Springfield, Nyetimber, Bognor Regis, Sussex, England

Filed Mar. 23, 1981, Ser. No. 246,321

Int. Cl.³ A44B *11/00*

U.S. Cl. 403—28 1 Claim



1. A heat-releasable safety belt coupling for connecting together two parts of a safety belt assembly, comprising a pair of interengaging attachment members for securing to parts of a safety belt assembly, a heat-releasable adhesive connection between said interengaging attachment members, said heat-releasable adhesive connection being capable of degradation at a predetermined temperature to release the attachment member from interengagement, and biasing means to urge the interengaging attachment members to separate on degradation of the heat-releasable adhesive connection.

4,532,682

CONNECTION FOR A JEWELRY BAND

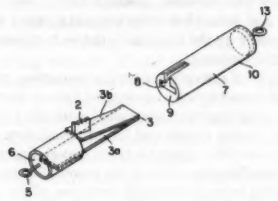
Masami Murao, Tokyo, Japan, assignor to Kabushiki Kaisha Murao Shoten, Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,699

Claims priority, application Japan, Sep. 17, 1982, 57-139942

Int. Cl.³ A44B *11/25;* A44C *5/08*

U.S. Cl. 24—616 20 Claims



1. A connection for a jewelry band, comprising:

(a) a male clasp member;

(b) a resilient detent member in the form of a folded leaf spring having a long tongue section extending from said male clasp member at a first end thereof and a short tongue section extending from said long tongue section at a second end thereof to normally maintain an angular posture but resiliently deflective to lie flatly against said long tongue section;

(c) a female clasp member having at least one peripheral wall forming a hollow body and an end wall to define an insertion chamber in cooperation with said hollow body, said end wall being formed with a slot extending to permit insertion of said long and short tongue sections while flatly lying against each other and to divide said end wall into an upper wall section and a lower wall section;

(d) means for supporting said resilient detent member within said chamber to prevent said resilient detent member from wobbling therewithin; and,

(e) said supporting means includes a rigid folded plate member having a long arm section extending longitudinally within said chamber from said lower wall section and a short arm section extending at an angle to said long arm section to receive said resilient detent member therein.

4,532,683

DEVICE FOR CUTTING SEAMS FREE IN A CORDUROY CUTTING MACHINE AND METHOD FOR OPERATING THE SAME

Albert Vroomen, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Franz Müller GmbH & Co., Monchen-Gladbach, Fed. Rep. of Germany

Continuation of Ser. No. 299,520, Sep. 4, 1981, abandoned. This application Apr. 17, 1984, Ser. No. 600,604

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033792

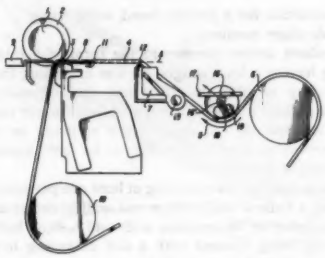
Int. Cl.³ D06C *13/08*

U.S. Cl. 26—10 C 7 Claims

1. Corduroy cutting machine, comprising a shaft, a multiplicity of circular knives laterally aligned on said shaft, a cutting edge associated with said knives, a plurality of needles having points and longitudinal slots formed therein and being insertible against a given travel direction of a web of material into floating wefts of the material to be cut open, each of said knives being immersible into one of said slots, a contact table disposed beneath the points of said needles, means for tensioning the web of material, a motor for driving the tensioning means, a switch connected to said needles and to said contact table for stopping the motor driving the tensioning means by accidental contact between said contact table and needles, a working plane being disposed upstream of said contact table in

travel direction of the web of material on which the web of material can be fed from below, a feed cylinder disposed upstream of said working plane in travel direction of the web of material around which the web of material to be cut can be looped from below and fed past said contact table to said cutting edge, a rear table disposed between said feed cylinder and said contact table upstream of said points of said needles for supporting the web of material, means for lowering said rear table for cutting the needles free, said working plane being defined by said needles, contact table, rear table and feed cylinder, and means for lowering said contact table below said working plane by the tension on the web of material when said rear table is lowered.

7. Method of operating a corduroy cutting machine, including a shaft, a multiplicity of circular knives laterally aligned on the shaft, a cutting edge associated with the knives, a plurality of needles having points and longitudinal slots formed therein and being insertible against a given travel direction of a web of material into floating wefts of the material to be cut open, each of the knives being immersible into one of the slots, a contact table disposed beneath the points of the needles, means for



tensioning the web of material, a motor for driving the tensioning means, a switch connected to the needles and to the contact table for stopping the motor driving the tensioning means by accidental contact between the contact table and needles, a working plane being disposed upstream of the contact table in travel direction of the web of material on which the web of material can be fed from below, a feed cylinder disposed upstream of the working plane in travel direction of the web of material around which the web of material to be cut can be looped from below and fed past the contact table to the cutting edge, the working plane being defined by the needles, contact table and feed cylinder, a rear table disposed at a distance from the contact table upstream of the points of the needles in travel direction of the web of material, the rear table being held in the working plane during cutting operation, means for lowering the rear table from the working plane, and means for lowering the contact table below the working plane by the tension applied to the web of material when the rear table is lowered for cutting the needles free, which comprises bending the web of material in the vicinity of the needles by lowering the rear table and the contact table, and forcing egress of all of the needles upward for automatically cutting the needles free.

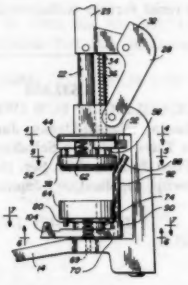
4,532,684

BUTTON ASSEMBLER

Malcolm J. Roebuck, Williamsburg, Va., assignor to Bagde-A-Minit Ltd., La Salle, Ill.

Filed Dec. 5, 1983, Ser. No. 557,748
Int. Cl.³ B21F *45/28*; D04D *7/04*
U.S. Cl. 29—4 **3 Claims**

1. A button making apparatus having a movable upper die having an inner shiftable portion and a stationary lower die, an annular plate above said upper die, an annular collar positioned between said plate and said upper die and secured to both, said collar having a horizontally disposed, through, rectangular aperture therein and shiftable therein, an elongated, rectangular in vertical cross-section bar in said aperture and extending outwardly thereof, a medial opening in said bar and a compression spring in said opening to urge the bar in inoperative position, a pair of opposed rods depending from said bar to contact the periphery of said upper die in inoperative position.

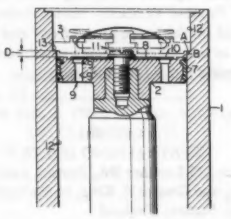


4,532,685

METHOD OF ASSEMBLING A RECIPROCATING COMPRESSOR

Kazuhiro Itoh, Wako; Mutsuo Sugisaki, Kamifukuoka, and Hiroshi Tanaka, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1983, Ser. No. 468,660
Claims priority, application Japan, Feb. 23, 1982, 57-27668
Int. Cl.³ B23P *15/00*
U.S. Cl. 29—156.4 R **1 Claim**



1. A method of assembling reciprocating compressors in order to increase the volumetric efficiency of said compressors by eliminating any irregularity in minimum volume of compression chambers for said respective compressors, which volume of each of said compression chambers is determined when a piston within the compression chamber is positioned at the top of its stroke thereby minimizing a top clearance of said piston, in which method a cylinder is provided including a first bore section and a second bore section of a diameter smaller than that of the former, into which second bore section is telescoped said piston for confronting across said compression chamber a closure end plate to be secured to said cylinder at the end of said first bore section, the method comprising the steps of:

(a) manufacturing in advance a plurality of groups of said end plates, each group of the end plates having an annular projection of a predetermined height h which differs from the heights of projections of the end plates in the other groups;

(b) defining a first reference position at a predetermined position of said piston at the top of its stroke and a second reference position on the wall of said cylinder and measuring an interval D between said first and second reference positions;

(c) selecting one appropriate group from said plurality of

groups of the end plates for each pair of the cylinder and the piston fitted therein so that the difference D-h becomes a predetermined value common to all the pairs of the cylinder and piston for the compressors;

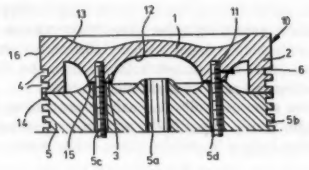
(d) securing an end closure plate of the selected group to the cylinder, thereby providing the reciprocating compressors of which compressor chambers have their minimum volume equalized to one another.

4,532,686

METHOD OF MAKING A PISTON BOTTOM

Rütger Berchem, Gelsenkirchen, Fed. Rep. of Germany, assignor to Berchem & Schaberg GmbH, Gelsenkirchen, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,317
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222582
Int. Cl.³ B23P *15/10*
U.S. Cl. 29—156.5 R **5 Claims**



1. A method of making a piston bottom for an internal-combustion engine piston, comprising the steps of:

forging a saucer-shaped blank from a refractory forging steel with a flat blank rim, a dished recess in said blank on one side thereof, a central convexity projecting into said recess and, on the opposite side of said blank, an annular bulge;

forging said saucer-shaped blank into a cup configuration whereby said rim is transformed into a cylindrical shoulder extending axially in the direction opposite that in which the convexity projects while shaping said bulge into an annular boss for attachment to a piston body on assembly of said piston; and

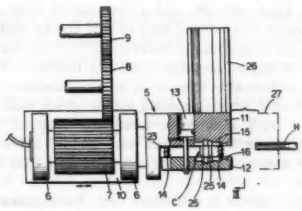
subjecting the cup formed in the second forging step to a homogenizing heat treatment.

4,532,687

DEVICE FOR ATTACHING A HOSE JOINT

Toshiyuki Souchi, Inazawa, and Isoo Todaka, Aichi, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Apr. 28, 1983, Ser. No. 489,673
Claims priority, application Japan, Apr. 28, 1982, 57-72246
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—235 **1 Claim**



1. In a device for attaching a hose joint having a sleeve to one end of a hose body having a predetermined length before the joint is secured thereto by caulking,

the improvement which comprises:

a chuck body which is rotatable about its own axis, and reciprocable along the longitudinal axis of the hose body;

said chuck body having a stationary portion and a movable portion which are divided from each other by a plane passing through the longitudinal axis of said chuck body;

said movable portion being reciprocally movable in a direction perpendicular to said plane, whereby the joint can be chucked in axial alignment with the hose body;

a pair of symmetric holding recesses being formed in the mutually facing surfaces of said stationary and movable portions, respectively, and defining a chucking portion, in which the movement of said movable portion into contact with said stationary portion defines a joint holding cavity which is contiguous to a funnel-shaped hose guide cavity defining an inlet for the hose body;

said joint holding cavity having a hexagonal holding portion in its mid-portion and a sleeve holding portion and a threaded-end holding portion on the opposite sides, respectively, of said hexagonal holding portion;

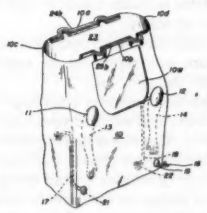
said holding cavity having a first tapered shoulder defined between said hexagonal holding portion and said sleeve holding portion, and a second tapered shoulder between said sleeve holding portion and said hose guide cavity.

4,532,688

METHOD AND APPARATUS FOR SERVICING FLUID METERS

James R. Dewberry, 1125 Wedgefield, Marietta, Ga. 30064

Filed Jun. 15, 1983, Ser. No. 504,617
Int. Cl.³ F16L *55/18;* **F17D** *3/00*
U.S. Cl. 29—402.08 **14 Claims**



1. A method of interchanging a service meter having disjointable inlet and outlet couplings and arranged to measure the flow of fluid from a source of fluid under pressure to a point of use, the method comprising the steps of loosening said couplings sufficiently to accommodate manual manipulation thereof, placing a replacement meter within an enclosing element having a normally closed purge port, securing said enclosing element having said replacement meter therein about said service meter and about said inlet and said outlet couplings in substantially fluid tight relation therewith, opening said purge port, manually loosening at least one of said couplings slightly to cause fluid to bleed into said enclosing element at a rate such that flow of fluid to said point of use is not substantially reduced and such that air is purged from said enclosing element, closing said purge fitting, manually manipulating said couplings so as to disconnect said service meter, said enclosing element constituting the sole conduit of fluid between said inlet and said outlet couplings following disconnection of said service meter, manually manipulating said couplings so as to connect said replacement meter therewith in finger tight relation, removing said enclosing element from about said replacement meter and said inlet and outlet couplings, and fully tightening said inlet and said outlet couplings, said service meter being retained within said enclosing element until after disasso-

ciation of said enclosing element from said replacement meter and from said inlet and outlet couplings.

4,532,689

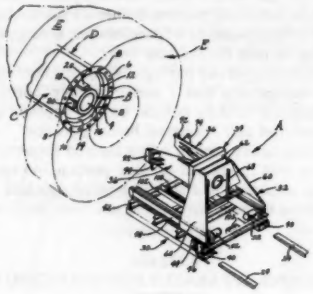
MACHINE FOR REMOVING ELECTRIC TRACTION MOTORS FROM WHEEL SPINDLES

John O. Harder, Maryland Heights; Doyle W. McCandless, St. Louis, and Michael W. Peterson, Maryland Heights, all of Mo., assignors to John Harder & Co., St. Louis, Mo.

Filed Sep. 29, 1982, Ser. No. 428,168

Int. Cl.³ H02K *15/16*

U.S. Cl. 29—426.5 **1 Claim**



1. The combination comprising:

(a) a motor mounted in a surrounding tubular structure and including a stator and a rotor within the stator;

(b) a machine for extracting the rotor and stator from the surrounding tubular structure, wherein:

(1) the stator includes a hollow case that fits snugly in said tubular structure,

(2) the stator having an open end exposed in said tubular structure and providing an annular recessed surface adjacent the open end,

(3) the machine includes a carriage movable toward and away from said exposed open end of said stator,

(4) a pair of extractor arms supported on said carriage and operable to move toward and away from each other.

(5) said pair of extractor arms being provided with pads sized to engage in said annular recessed surface of said stator, and stops spaced from and fixed in position with respect to said pads and adapted to abut on said open end of said stator to locate said pads in alignment for engaging said annular recessed surface; and

(c) power operated means on said machine for moving said pair of arms apart to position said pads against said annular recessed surface and to move said carriage axially from said surrounding tubular structure so that said motor may be withdrawn from said surrounding tubular structure.

4,532,690

PROCESS FOR PRODUCING A VALVE-AND-LID ASSEMBLY

Luigi Del Bon, Feldstrasse 141, and Franco Del Bon, Feldstrasse 139, both of 4663 Aarburg, Switzerland

Continuation-in-part of Ser. No. 259,158, Apr. 30, 1981, Pat. No. 4,442,959, and a continuation-in-part of Ser. No. 347,321, Feb. 9, 1982, Pat. No. 4,493,444. This application Nov. 24, 1982, Ser. No. 444,351

Claims priority, application Ireland, Nov. 26, 1981, 2780/81; Apr. 19, 1982, 920/82

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—451 **12 Claims**

1. A process for producing a valve-and-lid assembly comprising a lid and a valve body, which assembly has a central assembly axis and is adapted for closing the open top end of a container, which process comprises the steps of

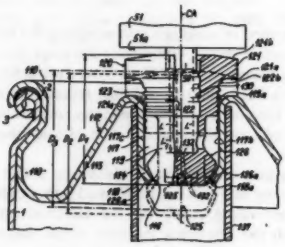
(A) producing, in finished condition, a lid, being rigid under conditions of filling product into, and discharging product from the interior of said container, the periphery of which lid is adapted for being sealingly connected with a top rim of a container sidewall surrounding the said open container top end, and which lid extends generally on a main lid plane transverse to said central assembly axis; said lid having a dome and a central opening in the middle of said dome;

at least a portion of said dome being an axially extending collar portion having an outer end zone destined to face away from, and an inner end zone destined to face toward, the interior of said container, and comprising at said inner collar end zone, an annular rim or shoulder edge about said central opening and adapted for sealing contact with said valve body, in a first contact zone of the latter;

(B) producing separately, from a synthetic resin of physical properties corresponding to those of Hytrel, with a Shore hardness A in the range of about 78 to 92, said valve body in finished condition, which valve body comprises

(a) a radially extending upper valve body portion having an outwardly facing upper surface, and an inwardly facing lower surface of a diameter larger than the diameter of said outer end zone of said collar portion,

(b) a valve stem centrally and axially protruding from said inwardly facing upper body portion surface and adapted for being lodged in said lid dome collar portion,



(c) a valve head at an end of said valve stem remote from said upper valve body portion and having a diameter, transverse to said central assembly axis, which is larger than the diameter of said valve stem; said valve head bearing said first annular contact zone so located thereon as to face, in the finished assembly, toward the inner collar end zone of said collar portion, and being adapted for making sealing contact with said annular rim or shoulder edge, when the assembly is in closed position, and, when said assembly is in open position, forming a gap therewith,

(d) a cavity having an opening in said upper surface of said upper valve body portion and extending axially at least into said valve stem and having a bottom end located near the radial plane in which said first contact zone on said valve head extends, and a determined axial depth from said valve body upper face to said cavity bottom end,

at least one of said upper valve body portions and said valve stem having an annular elastically resilient valve portion being deformable toward or in, axial direction,

(e) additional annular sealing means about said valve stem spaced from said valve head and adapted for making sealing contact at all times with said lid dome collar portion in a second zone axially spaced from said first contact zone,

(f) and duct means in said valve stem, having an exit opening for product flow into said cavity and an entry opening in a region of said valve stem extending from said first to short of said second contact zone;

(C) introducing said valve body into a part of said collar portion outside said central dome opening, and on a mandrel of such diameter as to fit axially and substantially snugly into said cavity and protruding from an annular frontal end face of a piston movably associated with a pressure cylinder, the frontal end face of which piston has an external diameter substantially larger than the cross-sectional diameter of said cavity in said upper surface of said upper valve body portion; said mandrel having a tip and an axial length greater than said determined axial depth of said cavity of the valve body when in undeformed state;

(D) striking said mandrel with sufficient force to drive the same together with said valve body abruptly into said collar portion of said lid dome with an impact pressure of about 2 to 8 bars depending on the Shore hardness of the valve body material; the distance by which the axial length of said mandrel exceeds said axial cavity depth and the length of travel of said mandrel during each stroke being sufficient to pass said valve head a short distance downwardly out of the annular rim or shoulder edge said central dome opening, with a limited stretching deformation of said elastically resilient valve portion;

(E) stopping the advance of the mandrel and the piston bearing the same when the mandrel has passed through said short distance; and

(F) withdrawing said mandrel upwardly out of engagement with said valve body, whereby said elastically resilient valve body portion contracts and moves said first contact zone of said valve head into sealing contact with said annular rim or shoulder edge at the central opening in said inner end zone of said dome collar portion.

4,532,691

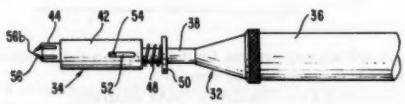
WIRE TERMINATION TOOL

Edward P. Brandeau, Martinsville, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 7, 1982, Ser. No. 447,593

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—566.4 **9 Claims**



1. An apparatus for making an interconnection between an electrical wire and a conductive terminal having a wire receiving slot therein, comprising:

a support;

a wire insertion head on said support and having a pushing element at one end thereof for engaging and urging said wire into said slot, said wire insertion head including an elongate shaft, one end of which is resiliently movably supported by said support and the other end of which defines said pushing element; and

a member for indexing said wire to said terminal, said indexing member comprising a sleeve resiliently movable axially relative to said shaft.

4,532,692

CHUCK JAW CHANGER FOR A MACHINE TOOL

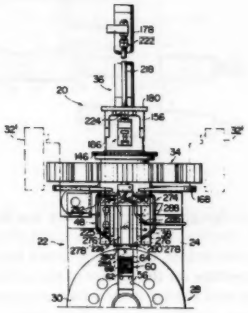
Chihiro Miyachi, Nagoya, Japan, assignor to Howa Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 14, 1983, Ser. No. 542,196

Claims priority, application Japan, Oct. 19, 1982, 57-183881; Mar. 28, 1983, 58-52228; Apr. 25, 1983, 58-73491; Apr. 25, 1983, 58-73492; May 24, 1983, 58-92084

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **28 Claims**



1. A chuck jaw changer for a machine tool having a work spindle, comprising:

a chuck having a chuck body adapted to be mounted on the work spindle of the machine tool and having a plurality of radial guideways therein for replacably receiving a set of gripping jaws therein, each gripping jaw being slidable into and out of one of the guideways when that guideway is in a preassigned jaw change position on the chuck body;

an indexing jaw magazine adapted to be rotatably mounted on the machine tool and having a plurality of holder portions therein for releasably holding additional sets of gripping jaws and for receiving gripping jaws withdrawn from said chuck body, said jaw magazine being indexable to a position for bringing any of the holder portions into line with the guideway in the chuck body which is in the jaw change position;

a jaw transfer mechanism for transferring a gripping jaw rectilinearly between the guideway in the chuck body which is in the jaw change position and the holder portion of said jaw magazine which is positioned in line therewith;

a jaw guide extending between said indexing jaw magazine and said chuck body and having a substantially continuous, rectilinear guide track thereon for guiding the gripping jaws during the transfer thereby by said jaw transfer mechanism, whereby any desired gripping jaw can be accurately transferred from the holder portions of the jaw magazine into one of the guideways in the chuck body and vice versa; and

a transport mechanism operatively associated with said jaw magazine, jaw transfer mechanism and jaw guide for moving them relative to the machine tool between a first position away from the chuck and a second position close to the chuck in which the jaw guide is aligned between said jaw magazine and said chuck.

4,532,693
TOOL EXCHANGING APPARATUS FOR A MACHINE TOOL HAVING A PLURALITY OF PROCESSING SPINDLES

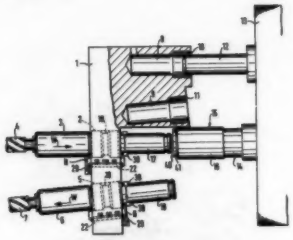
Karl Glücklhorn, and Wolfgang Carl, both of Aalen, Fed. Rep. of Germany, assignors to Alfing Kessler Sondermaschinen GmbH, Aalen-Wasseralfingen, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 512,954

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1983, 3301334

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **25 Claims**



1. Tool exchanging apparatus for a machine tool having a processing spindle, which has a quick-change adapter for receiving a tool holder, comprising: a tool holder; a tool carrier having an aperture for the receipt of the tool holder, means for moving said tool carrier from a tool charging position into a tool exchange position; means for moving the tool holder through the aperture of the tool carrier in a first direction; means for holding the tool holder, at least in its decoupling or coupling position, in said aperture in a manner such that movement in a second direction opposite to the first direction is blocked; biassing means; at least one engagement lug carried by said tool holder and which can be retracted by a limited distance relative to the tool carrier in said second direction against said biassing means; means for preventing rotary movement of said tool holder in said aperture of the tool carrier when the engagement lug is retracted; and means that enable the means for preventing rotary movement to be responsive to retraction of the engagement lug.

4,532,694
METHOD OF FABRICATING EMITTER/DETECTOR-IN-A-WELL FOR THE INTEGRATION OF ELECTRONIC AND OPTOELECTRONIC COMPONENTS

Robert M. Kolbas, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 272,603, Jun. 11, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,846

Int. Cl.³ H01L *21/20, 21/208*

U.S. Cl. 29—569 L **12 Claims**

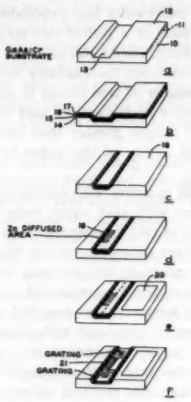
1. A method of fabricating planar structured solid state electro-optic elements comprising the steps of:

preparing a semi-insulating substrate having a substantially planar surface;

etching a wide depression on the order of 100–500 microns wide in the planar surface of the substrate to prepare a site for an optoelectronic component;

epitaxially growing over said depression and planar surface a thin semiconductor deposition to substantially fill said depression;

chemical-mechanical polishing said epitaxially covered planar surface to re-expose said substrate and establishing a new planar surface which surface effectively includes the epitaxially grown deposition in said depression; and,



doping a portion of said epitaxially grown deposition to form a diode, the diode being an active portion of the optoelectronic component.

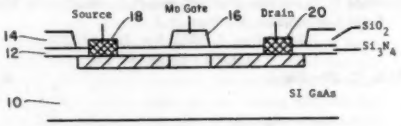
4,532,695
METHOD OF MAKING SELF-ALIGNED IGFET

Fritz L. Schuermeyer, Yellow Springs, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 2, 1982, Ser. No. 394,591

Int. Cl.³ H01L *21/265*

U.S. Cl. 29—571 **15 Claims**



1. A self-aligned process for fabricating a semiconductor device which comprises the steps of:

a. providing a semi-insulating GaAs substrate;

b. coating the substrate with a plasma enhanced deposited Si_3N_4 layer and a SiO_2 layer;

c. etching off the SiO_2 layer in areas where transistors will be located;

d. ion implanting, with the SiO_2 layer acting as a mask, which provides channel doping;

e. depositing and delineating a gate of conductive refractory material;

f. forming source and drain regions by ion implantation to provide n+ region extending to the gate region, with the SiO_2 layer and the gate acting as masks;

g. annealing with the Si_3N_4 acting as an annealing cap;

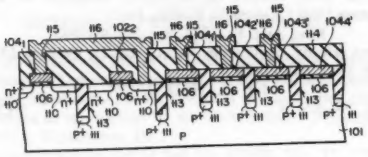
h. etching holes into the Si_3N_4 for source and drain contacts, depositing the source and drain contacts and sintering the device for activation of these contacts.

4,532,696

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE FOR FORMING A DEEP FIELD REGION IN A SEMICONDUCTOR SUBSTRATE

Hiroshi Iwai, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 16, 1983, Ser. No. 475,944
Claims priority, application Japan, Mar. 26, 1982, 57-48573
Int. Cl.³ H01L *21/283, 21/265*
U.S. Cl. 29—571 25 Claims



2. A method of forming a gate electrode of a semiconductor device comprising the steps of:

forming a gate electrode material pattern on a gate insulating film deposited on a conductive type semiconductor substrate;

forming a gate electrode by selectively forming a groove in said gate electrode material pattern; and

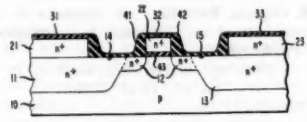
burying insulating material in said groove.

4,532,697

SILICON GIGABIT METAL-OXIDE-SEMICONDUCTOR DEVICE PROCESSING

Ping K. Ko, Ocean, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 2, 1983, Ser. No. 557,638
Int. Cl.³ H01L *21/225, 21/425*
U.S. Cl. 29—571 9 Claims



1. A method of forming a channel region in a semiconductor substrate of first type conductivity, the substrate having a mesa of semiconductor material thereon and a layer of insulator material interposed between the mesa and the substrate, the method being characterized by the steps of

differentially oxidizing the mesa and substrate to cause an insulator material layer to grow thicker on the sides of the mesa than on the exposed surface of the substrate,

implanting dopant ions into at least the exposed surface of the substrate to cause a region of second type conductivity to be formed therein, and

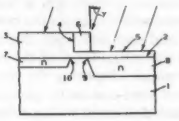
heating the mesa and substrate to diffuse the dopant ions into the substrate thereby defining the channel region in the substrate between the regions of second type conductivity, the channel region being substantially coextensive with the mesa.

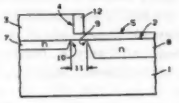
4,532,698

METHOD OF MAKING ULTRASHORT FET USING OBLIQUE ANGLE METAL DEPOSITION AND ION IMPLANTATION

Frank F. Fang, Yorktown Heights; Bertrand M. Grossman, New York, and Wei Hwang, Armonk, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1984, Ser. No. 623,810
Int. Cl.³ H01L *21/283, 21/22, 21/265*
U.S. Cl. 29—571 5 Claims





1. In the formation of semiconductor structures by the use of indirectly determined dimensions with respect to the surface of a semiconductor crystal, the improvement process comprising

forming by depositing at a low angle with respect said surface a mask member against a positioned locating face, said mask having a dimension parallel to said surface determined by both desired device dimension and processing tolerance movement, and

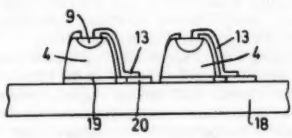
converting the conductivity of the region of said crystal adjacent said surface from an angular direction by ion implantation to cause said conversion to progress to a point under at least a portion of said mask.

4,532,699

PROCESS FOR MANUFACTURING A MATRIX INFRARED DETECTOR WITH ILLUMINATION BY THE FRONT FACE

Michel Bourdillot, Chasseneuil Du Poitoux; André Gauthier, Paris; Jacques Maillé , Paris, and Bernard Pitault, Paris, all of France, assignors to Societe Anonyme de Telecommunications, France

Filed Nov. 25, 1983, Ser. No. 555,163
Claims priority, application France, Nov. 30, 1982, 82 20031
Int. Cl.³ H01L *21/302, 21/31*
U.S. Cl. 29—572 9 Claims



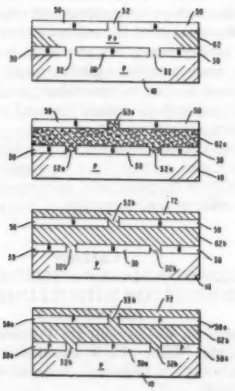
1. A process for manufacturing a matrix infrared detector with illumination on a front face, which comprises providing a first semi-conductor wafer of one conductivity type, p or n,

and forming thereon, from the front face to be illuminated, a relief in the form of islets or raised zones having top and bottom levels and side walls connecting said top and bottom levels; depositing a dielectric layer on said relief zones, opening a window in said dielectric layer, using said dielectric layer as a diffusion mask and as an insulating layer for a subsequently deposited metallization layer, diffusing through said window a dopant into the top level of the relief zones to form regions of an opposite conductivity type in order to define junctions and to form a matrix of elementary detectors; forming, in one step, a metallic connection on each said relief zone that extends from said region of an opposite conductivity type on said top level of said relief zone and thence over at least one of said side walls of said relief zone and thence to the bottom level of said relief zone adjacent said one side wall; thinning the wafer from its rear face up to the ottom level of the relief zone and isolating the contact terminals; disposing the thinned wafer, by its rear face, on a second semi-conductor processing wafer adapted to process the signals delivered by the elementary detectors of the wafer; and connecting said contact terminals to associated metallization zones of the processing wafer.

4,532,700
METHOD OF MANUFACTURING SEMICONDUCTOR STRUCTURES HAVING AN OXIDIZED POROUS SILICON ISOLATION LAYER

Wayne I. Kinney, Albuquerque, N. Mex.; Jerome B. Lasky, Essex Junction, and Larry A. Nesbit, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1984, Ser. No. 604,563
Int. Cl.³ H01L *21/20, 21/76*
U.S. Cl. 29—576 W **15 Claims**



1. A method of forming a semiconductor structure having dielectrically isolated monocrystalline silicon regions comprising:

(a) providing a silicon body of a predetermined conductivity;

(b) forming in said silicon body a set of buried regions which under predetermined anodizing conditions etch slower than the silicon regions adjacent them;

(c) forming a set of surface regions which under said anodizing conditions etch slower than the silicon regions around them wherein said surface regions overlie said regions between adjacent buried regions and partially overlie said adjacent buried regions and wherein said buried regions and said surface regions define a portion in said silicon body which etches faster than said buried and surface regions under said predetermined anodizing conditions;

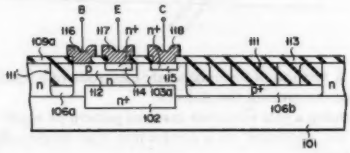
(d) anodically etching said silicon body to selectively convert said silicon regions between buried regions and surface regions and said silicon portion between said two sets of regions into porous silicon material;

(e) subjecting said silicon body to oxidation to convert said porous silicon material into silicon dioxide.

4,532,701
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Shuichi Kameyama; Satoshi Shinozaki, both of Yokohama, and Hiroshi Iwai, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 19, 1982, Ser. No. 410,083
Claims priority, application Japan, Aug. 21, 1981, 56-131018; Dec. 25, 1981, 56-212459
Int. Cl.³ H01L *21/76*
U.S. Cl. 29—576 W **9 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming a first groove having a large width in a semiconductor layer;

filling said first groove with a first insulating film;

forming a mask pattern on that portion of the first insulating film which fills the first groove;

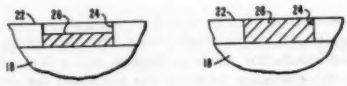
selectively etching said first insulating film in said first groove using the mask pattern as a mask to form at least one second groove in said first insulating film, said second groove having a narrow width; and

filling said second groove with a second insulating film to form an isolation layer having a large width.

4,532,702
METHOD OF FORMING CONDUCTIVE INTERCONNECTION BETWEEN VERTICALLY SPACED LEVELS IN VLSI DEVICES

Joseph R. Gigante, Beltsville, and Rathindra N. Ghoshtagore, Columbia, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1983, Ser. No. 549,125
Int. Cl.³ H01L *21/285*
U.S. Cl. 29—578 **6 Claims**



1. Method of depositing a thick conductive metal plug and barrier in an aperture in a dielectric layer over a semiconductive layer, which thick conductive metal plug and barrier permits electrical interconnection between the semiconductive layer and a conductive layer which is thereafter disposed atop the conductive plug, which method comprises:

(a) treating the semiconductive layer through the aperture in the dielectric layer with an activation agent;

(b) selectively depositing the conductive metal on the activated semiconductive layer to a predetermined thickness;

(c) treating the deposited conductive metal through the

aperture in the dielectric layer with the activation agent; and

(d) repeating the selective deposition of the conductive metal onto the activated surface and treating the deposited metal surface with activation agent, and selective deposition until the aperture is filled with conductive metal which serves as an electrical interconnection means and a barrier against conductor migration into the semiconductive layer.

4,532,703

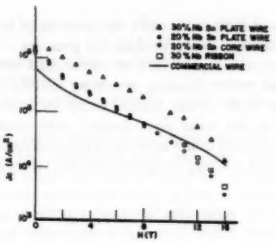
METHOD OF PREPARING COMPOSITE SUPERCONDUCTING WIRE

John D. Verhoeven; Edwin D. Gibson; Douglas K. Finnemore; Jerome E. Ostenson; Frederick A. Schmidt, and Charles V. Owen, all of Ames, Iowa, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 85,653, Oct. 17, 1979, abandoned. This application Apr. 24, 1981, Ser. No. 257,013

Int. Cl.³ H01L *39/24*

U.S. Cl. 29—599 **29 Claims**



1. A method of preparing composite multifilament superconducting wire comprising:

providing a generalized cylindrical-shaped billet of an alloy of copper containing at least 15 weight percent niobium, the niobium being present in the copper as discrete, randomly distributed and oriented, elongated dendritic-shaped particles having an aspect ratio of about 50 to 100, the dendrites generally being from about 1 to 25 μm in diameter and from about 100 to 250 μm in length;

providing at least one longitudinal hole through the billet, the volume of the hole being such that when filled with tin it can contain a stoichiometric amount to react with the niobium in the tube to form Nb_3Sn;

filling the hole with tin to form a composite drawing rod;

cold-working the composite rod to form an elongated wire of a desired shape and size to orient the dendritic-shaped particles parallel to the longitudinal axis of the wire and to elongate the particles to form a wire containing a plurality of fine filaments of niobium and at least one filament of tin in a copper matrix.

4,532,704

DIELECTRIC WAVEGUIDE PHASE SHIFTER

Jerome J. Green, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 272,809, Jun. 11, 1981,. This application Nov. 4, 1983, Ser. No. 548,810

Int. Cl.³ H01P *11/00*

U.S. Cl. 29—600 **3 Claims**

1. A method of manufacturing a phase-shifter column comprising the steps of:

grinding parallel grooves in a first and second keeper ferrite sheets;

bonding a first and second phase-shifting ferrite sheet, respectively, said first and second phase-shifting ferrite sheets on the surface having said grooves to produce a first and second assembly bonding a sheet of dielectric to the phase-shifting side of said first assembly;

grinding through said dielectric sheet to produce parallel dielectric ribs opposite said grooves in said first assembly; and

bonding the phase-shifting side of said second assembly on the surfaces of said dielectric ribs, with the grooves of said second assembly opposite said dielectric ribs.

4,532,705

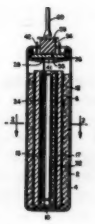
METHOD OF MAKING AN ELECTROCHEMICAL CELL HAVING A RESEALABLE VENT CLOSURE

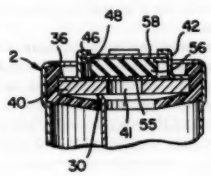
Ronald L. Zupancic, Parma Heights, and Lewis F. Urry, Columbia Station, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 344,945, Feb. 2, 1982, abandoned, which is a division of Ser. No. 190,989, Sep. 26, 1980, Pat. No. 4,328,289. This application Jan. 16, 1984, Ser. No. 571,066

Int. Cl.³ H01M *2/12*

U.S. Cl. 29—623.2 **8 Claims**





1. A method for assembling an electrochemical cell comprising a solid component and a liquid component with a low pressure resealable vent closure which method comprises:

(a) placing the solid component of a cell within a container having an open end, said container having secured to said open end a cover, said cover having a vent orifice;

(b) securing a hollow retainer means to the cover such that said hollow retainer means surrounds the vent orifice, said retainer means having an open outer end having tabs extending therefrom;

(c) feeding the liquid component of the cell through the vent orifice into the container;

(d) placing a resilient deformable member of an elastomeric

material within said hollow retainer means and over the vent orifice;

(e) placing a retainer element within said hollow retainer means and over the resilient deformable member;

(f) compressing said resilient deformable member over said vent orifice thereby providing a fluid tight seal at said vent orifice; and

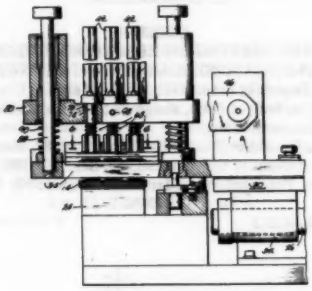
(g) securing the retainer element against the compressed resilient deformable member by turning over the tabs of the outer end of the hollow retainer means onto said retainer element.

4,532,706

RETAINING RING ASSEMBLY MACHINE

Edward R. Horn, Germantown, Wis., assignor to Aladdin Engineering, Brookfield, Wis.

Filed Jul. 28, 1983, Ser. No. 518,123
Int. Cl.³ B23Q *7/10*; B23P *11/02*
U.S. Cl. 29—809 **18 Claims**



1. Apparatus for use in placing a snap ring of the type including a generally circular inner surface and having a central longitudinal axis on a cylindrical pin of the type adapted to support a snap ring, the apparatus comprising:

means for supporting a cylindrical pin,

means for supporting a plurality of snap rings in aligned stacked relation, the stack of snap rings having a longitudinal axis,

means for moving a selected bottom one of the snap rings supported in aligned stacked relation in a direction transverse to the longitudinal axis of the stack of snap rings to a position wherein the selected snap ring is aligned with the cylindrical pin,

means for supporting the selected snap ring such that the longitudinal axis of the selected snap ring is aligned with the longitudinal axis of the cylindrical pin, and

means for forcing the selected snap ring in the direction of the longitudinal axis of the selected snap ring from the means for supporting the snap ring onto the end of the cylindrical pin.

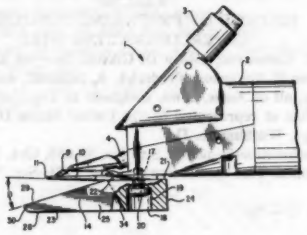
4,532,707

ANIMAL HAIR SHEAR AND CUTTING DEVICE

Gary D. Allen, Allen, Tex., assignor to Stone Manufacturing & Supply Co., Kansas City, Mo.

Filed Feb. 16, 1983, Ser. No. 445,415
Int. Cl.³ B26B *19/24*
U.S. Cl. 30—200 **5 Claims**

1. Electrical operated animal hair shearing or clipping device including an electric motor housing, blade means reciprocatable laterally by the motor, a first comb member carried by the device adjacent the blade means and a second comb member carried by the device adjacent the first comb member, with the first comb member being disposed between the blade means and the second comb member; wherein the first comb member is inclined outwardly and upwardly at an angle to the second comb member; the teeth of the second comb member extend outwardly a greater distance than the teeth of the first comb member; the first comb member has a plurality of teeth greater in number than the teeth of the second comb member; each pair of adjacent teeth of the first comb member diverge to their outer ends remote from the motor housing to form angled grooves open at their outer ends and the adjacent teeth of the second comb member extend from the motor housing substantially parallel to their outer ends to form a plurality of straight



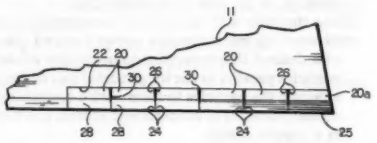
grooves open at their outer ends; the grooves of the first comb member are smaller in width than the grooves of the second comb member; the top surface of the second comb member includes a flat motor housing mounting surface and the top surface of the teeth of the second comb member are angled downwardly to the outer ends thereof; and wherein the flat surface of the second comb member is mountable to the underside of the motor housing and presents a flat bottom surface for the device.

4,532,708

ROTARY LAWN MOWER BLADE

Harold F. Mensing, 6394 Peninsula Rd., Erie, Mich. 48133

Filed Apr. 10, 1984, Ser. No. 598,667
Int. Cl.³ A01D *55/18*
U.S. Cl. 30—347 **24 Claims**

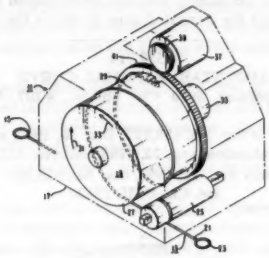


1. A rotary lawn mower cutter blade comprising: an elongated steel cutter bar adapted to rotate about an axis located in its center extending perpendicularly through a flat midsection, a plurality of cutter segments fusibly bonded along a leading edge of each end of said bar, said segments each having a cutting edge and a hardness greater than the hardness of said cutter bar, said segments being arranged in series with the outer end of each segment abutting the adjacent inner end of a succeeding segment in the series at the cutting edge, each of said segments having a cutting face angled upwardly and rearwardly from its cutting edge, said cutting edge being disposed at a non positive rake angle and a cutter tip segment fusibly bonded to said cutter bar adjacent to the outermost cutter segment of each of said series of cutter segments.

4,532,709
HIGH PRECISION ELECTRONIC DIGITAL MEASUREMENT SYSTEM WOUND ON CONSTANT-TORQUE-CONTROLLED DRUM

Hans E. Leumann, Washington; Kenneth S. Gerkey, and Mark E. Wylie, both of Mt. Lebanon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1984, Ser. No. 663,264
Int. Cl.³ G01B *7/02*
U.S. Cl. 33—140 **18 Claims**



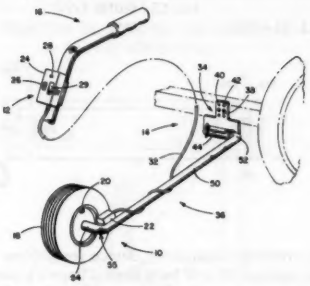
1. A measuring module comprising:
(a) support means;
(b) a drum member rotatably mounted on said support means;
(c) a measuring member operably associated with said drum member and having at least one end thereof extending from said drum member such that for the rotational movement of said drum member in a first direction said at least one end is drawn up onto said drum member and for rotational movement in a second direction said at least one end is played out from said drum member;
(d) means for providing a predetermined value of constant torque to said drum member in communication therewith in order to effect the rotational movement thereof whereby a constant and repeatable tensioning of said measuring member is effected; and
(e) means for generating an output signal reflective of the rotational movement of said drum member, operably associated with said drum member.

4,532,710
DISTANCE MEASURING DEVICE FOR GOLF CARTS AND THE LIKE

Philip C. Kinney; Mir Imran, and Edward J. Donnelly, all of Pittsburgh, Pa., assignors to Phyronics, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 380,239, May 20, 1982, abandoned.
This application Aug. 6, 1984, Ser. No. 637,701
Int. Cl.³ G01B *3/12;* G01C *22/00*
U.S. Cl. 33—141 E **6 Claims**

1. A programmable device for measuring distance travelled by a golf cart or the like, comprising:
sensing means for sensing consecutive revolutions of a wheel, and providing corresponding consecutive sensor output signals;
programming means responsive to user operation for receiving operator input data representing a dimension of the wheel;
processing means responsive to said corresponding consecutive sensor output signals and to said operator input data from said programming means for deriving output data corresponding to distance travelled by the golf cart, said processing means including a clock proving clock pulses, a counter for counting in accordance with a clock input, a gate responsive to each occurrence of said corresponding successive sensor output signals for providing said clock pulses to said counter as said clock input thereto, causing said counter to count and to develop a count output therefrom, whereby to derive said data corresponding to said distance travelled by the golf cart; and

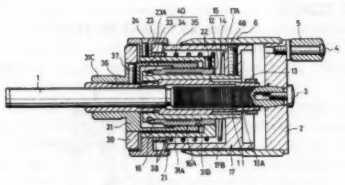


display means responsive to said output data derived by said processing means for displaying the distance travelled by the golf cart.

4,532,711
MICROMETER HEAD

Tamenori Shirai, Kure, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,832
Claims priority, application Japan, Jul. 27, 1982, 57-114354[U]
Int. Cl.³ G01B *3/18, 5/00*
U.S. Cl. 33—164 R **11 Claims**



1. In a micrometer head wherein a spindle threadably coupled to a sleeve is moved in the axial direction relative to said sleeve in response to rotation of a thimble which is coupled to said spindle for synchronous rotation therewith, the improvement comprising an intermediate tubular member supported on said sleeve in a manner so as to be movable axially and rotationally relative to said sleeve, wherein said intermediate tubular member is connected to said sleeve through a connecting means in a manner so as to be simultaneously movable with said sleeve in the axial direction of said spindle, wherein said intermediate tubular member is synchronously rotatably connected with an adjusting ring spaced a predetermined distance apart from said thimble, wherein a graduation ring is disposed inside said thimble and has an outer peripheral surface exposed beyond one end edge of said thimble, said graduation ring being synchronously rotatably connected to said sleeve, wherein said intermediate tubular member is threadedly coupled to a mount fixable portion which is adapted to be mounted to a measuring instrument, and wherein rotation of said intermediate tubular member due to rotation of said adjusting ring relative to said mount fixable portion causes said sleeve, said spindle, said graduation ring and said thimble to be simultaneously moved in the axial direction of said spindle relative to said mount fixable portion.

4,532,712

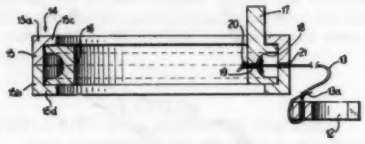
PROXIMITY MEASURING DEVICE FOR GOLFERS

James E. Vistain, 1320 Bonnie Glen, Glenview, Ill. 60025

Filed Sep. 1, 1983, Ser. No. 528,645

Int. Cl.[3] G01B 3/10

U.S. Cl. 33—180 7 Claims



1. A proximity comparing device for golfers to determine relative distance of golf balls from a flagstick comprising:

a clamping ring releasably engageable with said flagstick and having a sufficiently low coefficient of friction to be slidable about the periphery thereof while engaging said flagstick,

a string having one end anchored to said clamping ring, and

a reel securing the opposite end of said string and providing a variable amount of string for measuring distances from said flagstick, said reel including a pair of concentric inner and outer rings rotatable relative to each other, the other end of said string being wound about said inner ring and said outer ring permitting entry and withdrawal of said string from about said inner ring.

4,532,713

MULTICOORDINATE SENSING HEAD

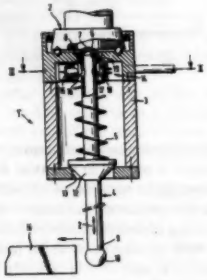
Kurt Feichtinger, Pulling, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunruet, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 518,928

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3229992

Int. Cl.[3] G01B 11/24

U.S. Cl. 33—559 8 Claims



1. In a sensing head adapted to be mounted to a measuring or processing machine, said sensing head comprising a casing and a sensing pin having a sensing end and a mounting end, the improvement comprising:

means, included in the casing, for allowing the mounting end to move along a predetermined axial direction while constraining the mounting end of the sensing pin against radial movement perpendicular to said axial direction;

a first, rotationally symmetric element mounted to the sensing pin at a point intermediate of the sensing end and the mounting end;

a second element included in the casing adjacent the first element, said second element shaped to bear against the first element in order to center the sensing end of the sensing pin in a predetermined rest position in the absence of radial forces on the sensing end and to cause the mounting end of the sensing pin to move along the axial direction in response to radial deflection of the sensing end of the sensing pin; and

means, mounted adjacent the mounting end of the sensing pin, for sensing the axial position of the mounting end of the sensing pin and for generating a deflection signal in response thereto;

said first element mounted to the sensing pin comprising a truncated cone and said second element included in the casing comprising a torus defining a central opening sized to receive the sensing pin, said torus shaped to surround and contact the truncated cone to center the sensing pin.

4,532,714

ADJUSTABLE RADIAL CURVE

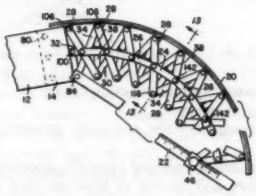
Richard R. Spinning, 8960 NW. 8th St., #207, Miami, Fla. 33172

Continuation of Ser. No. 454,527, Dec. 30, 1982, abandoned. This application Aug. 22, 1983, Ser. No. 525,207

Filed Aug. 22, 1983, Ser. No. 525,207

Int. Cl.[3] B43L 13/20

U.S. Cl. 33—177 21 Claims



1. An adjustable radial curve comprising:

a supporting bar;

a plurality of radial arms, long chords, diagonal braces and brace chords are fastened to each other and to the supporting bar

a flexible ruling edge attached to said radial arms and diagonal braces; and

a bar scale attached to one of said radial arms and one of said diagonal braces.

4,532,715

INSPECTION MACHINE AND METHOD FOR MEASURING THE CIRCULAR PITCH SPACING OF TEETH ON A MEASUREMENT CIRCLE OF A GEAR

Armin Sterki, Uetikon, Switzerland, assignor to Maag Gear-Wheel & Machine Company, Ltd., Zurich, Switzerland

Filed Feb. 27, 1984, Ser. No. 583,972

Claims priority, application Switzerland, Mar. 7, 1983, 1222/83

Int. Cl.[3] G01B 7/28

U.S. Cl. 33—179.5 R 8 Claims

1. An inspection machine for measuring the circular pitch spacing of teeth on a measurement-circle of a gear, comprising:

a measurement sensor having a pre-loadable feeler capable of being deflected by a flank of a tooth of the gear being measured, having an active sensing range with a range of linear response and generating an output signal defining a linear measurement value;

a first transport carriage translatably drivable in a direction substantially radial to the gear for mounting said measurement sensor;

rotary drive means for angularly displacing the gear;

angular displacement sensing means capable of being operatively connected to the gear and generating a pulse signal defining an angular measurement value when said measurement sensor enters said range of linear response;

a control processor connected to said angular displacement sensing means for controlling measurement operations and for computing measurement values;

said measurement-circle of the gear having a radius;

a radius measuring system operatively associated with said first transport carriage for measuring a set value of said radius;

a multiplier unit operatively connected to said radius measuring system for generating a measurement value;

said multiplier unit having an output terminal;

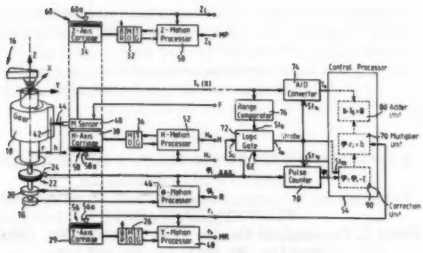
an angular displacement correction unit operatively connected to said multiplier unit and having a chip-select input terminal;

a storage flip/flop operatively connected between said angular displacement correction unit and said angular displacement sensing means and having a chip-select input terminal;

an analog-to-digital conversion unit operatively connected between said measurement sensor and said control processor for generating a measurement value and having a chip-select input terminal;

said analog-to-digital conversion unit having an output terminal;

a logic gate having an enable signal input terminal operatively connected to said control processor, a signal input terminal operatively connected to said angular displacement sensing means and a signal output terminal commonly operatively connected to respective ones of said



chip-select input terminals of the analog-to-digital conversion unit, the storage flip/flop and the angular displacement correction unit for latching said angular measurement value of the angular displacement sensing means into the storage flip/flop and said linear measurement value of the measurement sensor into the analog-to-digital conversion unit and for initiating an angular displacement correction operation in the angular displacement correction unit upon arrival of said pulse signal defining said angular measurement value;

a range comparator unit provided for the measurement sensor for responding to said output signal defining said linear measurement value of the measurement sensor when the measurement sensor enters the range of linear response and operatively connected to said chip-select input terminal of said logic gate and with the analog-to-digital conversion unit; and

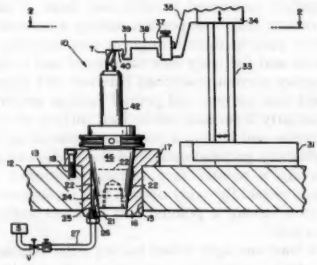
an adder unit provided in said control processor and operatively connected to respective ones of said output terminals of the analog-to-digital conversion unit and of the multiplier unit for performing an algebraic addition of said measurement value supplied by the analog-to-digital conversion unit and said measurement value supplied by the multiplier unit to determine a true acuate distance on the measurement-circle of the gear and to determine therefrom a circular pitch spacing of the gear.

4,532,716

TOOL PRESETTING DEVICE WITH TAPERED AIR SPINDLE MOUNT

Rudolph Steiner, Fairport, N.Y., assignor to Parlec, Inc., Fairport, N.Y.

Filed Oct. 31, 1983, Ser. No. 546,819
Int. Cl.³ G01B 5/02
U.S. Cl. 33—201 **6 Claims**



1. A tool presetting device, comprising

a support having an inverted, frusto-conically shaped opening in an upper surface thereof,

a tool holder disposed to have a tool releasably secured in one end thereof, and having on its opposite end an inverted frusto-conically shaped bearing surface similar in configuration to the wall defining said opening in said support, and disposed to be seated releasably in said opening coaxially thereof, thereby to support said one end thereof and any tool therein vertically above said support,

a gauge adjustably mounted adjacent said support and carrying a feeler element disposed to engage said tool in said holder during a presetting operation,

said wall having intermediate its ends a circumferential recess disposed to surround and to be sealed by said bearing surface on said holder, when the holder is releasably seated in said opening, and

means for supplying fluid under pressure to said recess, when said holder is seated in said opening, thereby to enable said holder to be urged slightly upwardly in said opening against the force of gravity, thereby enabling said holder readily to be rotated manually relative to said support.

4,532,717

BOW SIGHT

Ira L. Watson, and Craig V. Watson, both of 7377 W. Fremont Dr., Littleton, Colo. 80123

Filed Jul. 25, 1983, Ser. No. 516,924
Int. Cl.³ F41G 1/00
U.S. Cl. 33—265 **18 Claims**

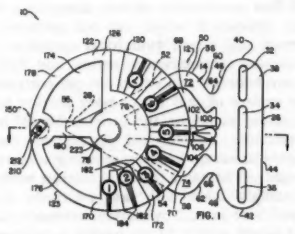


FIG. 1

1. A bow sight for use with an archery bow comprising:

(a) a mounting bracket having a flat body portion with an

inside face positionable against an abutting surface of a bow riser and an outside face surface positioned opposite and parallel said inside face surface; a plurality of linearly aligned elongate slots extending through said flat body portion and positioned at a first end thereof;

a raised boss portion projecting perpendicularly from said inside face of said flat body portion and positioned at a second end of said flat body portion opposite said first end, said boss portion having a truncated conical surface with an axially outwardly radially inwardly tapering peripheral surface portion and a radially extending surface portion positioned parallel said faces of said flat body portion; said boss portion having a centrally positioned bore passing therethrough in perpendicular relationship with said flat body face surfaces of said body portion;

a pointer portion positioned between said aligned slots and said boss portion said pointer portion projecting perpendicularly from said inside face surface of said flat body portion and having a pointer peripheral surface oriented generally perpendicular said flat body face surfaces and having a pointer face surface positioned substantially parallel said flat body outside face surface with a configuration having a pointed end directed toward said boss portion;

(b) at least one sight wheel having a flat substantially circular body portion having a circumferential edge surface and housing a wheel body inside face surface positionable in spaced apart adjacent relationship with said bracket body inside face surface and having a wheel body outside face surface positioned opposite and parallel said wheel body inside face surface; said wheel body having a wheel body central bore provided at the center of said wheel body in coaxial alignment with said bracket boss portion central bore;

a circular rib portion symmetrically positioned about said central bore and projecting perpendicularly from said wheel body inside face surface, said circular rib portion having an inner rib surface projecting axially outwardly and radially outwardly relative the central axis of said central bore; said inner rib surface being adapted to receive and frictionally engage said peripheral wall surface of said bracket boss portion;

a wheel cylindrical extension portion extending perpendicularly outwardly from said wheel body inside face surface, said cylindrical extension portion having a relatively small diameter relative the diameter of said wheel body portion and being positioned at a circumferential portion of said wheel circular body, said cylindrical extension portion having a circular face surface, and having a relatively large diameter bore extending from said circular face surface substantially half the length of said cylindrical extension and having a relatively small diameter tapped bore extending in coaxial alignment with said relatively large diameter bore through the remainder of said cylindrical extension portion and said through wheel body portion whereby a circular opening is provided on said wheel body outer face surface; said wheel body portion comprising a first semicircular section and a second semicircular section opposite said first semicircular section, said first semicircular section comprising two symmetrically positioned wheel cut out portions in quadrants thereof; said wheel cylindrical extension portion being positioned symmetrically within said first semicircular section between said wheel cut out portions; said outside face surface of said wheel body portion having radially projecting marks on the surface thereof in said second semicircular section and having an outside surface adapted to accept pressure sensitive adhesive material;

(c) a sight pin having a threaded exterior surface adapted to threadingly mate with said relatively small diameter tapped bore in said cylindrical extension portion of said sight wheel, said sight pin having a roughened relatively large diameter portion at a first end thereof to facilitate screwingly adjusting the position of said sight pin relative said cylindrical extension portion of said sight wheel, and having a tapered second end portion having a relatively small diameter bead at the terminal end thereof, said sight pin having a sight pin nut mounted thereon and abuttingly contacting said outside face surface of said wheel body portion;

(d) attachment means for rotatably attaching said sight wheel to said mounting bracket comprising a threaded bolt adapted to be received through said boss portion central bore and said wheel body portion central bore; an annular spring washer for biasing said sight wheel rib portion against said bracket boss portion positioned about said threaded bolt in abutting contact with said bracket outer face surface; an annular flat washer positioned about said bolt adjacent said spring washer; and a nut threadingly mounted at an end portion of said bolt in abutting contact with said flat washer; whereby a biasing force between said bracket and said sight wheel is adjustable by selective tightening or loosening of said nut on said bolt; and

(e) pressure sensitive adhesive markers mounted on said outside face surface of said wheel body portion within said second semicircular section at predetermined, calibrated positions thereon;

(f) said sight wheel and said bracket being constructed and arranged whereby said pointed end of said pointer portion is positioned in closely spaced relationship relative the circumferential edge surface of said wheel body portion.

4,532,718

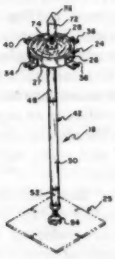
PLUMBING APPARATUS

David C. Copeland, 36 Georgia Trail, Medford, N.J. 08055

Filed Dec. 30, 1983, Ser. No. 567,337

Int. Cl.³ G01C 9/36

U.S. Cl. 33—390 **17 Claims**



1. A plumbing apparatus to carry a reference point exactly vertically comprising:

(a) a leveling means to determine level condition in all horizontal directions radial to an axis line of the plumbing apparatus,

(b) a marking guide means on the leveling means that guides marking on a surface to which the point is to be transferred that fix lines that pass through the axis line,

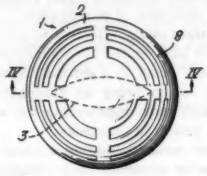
(c) a rod means attached to the leveling means to extend a rod plumb from the level condition, and

(d) a point location means on the end of the rod to define a point on the axis line.

4,532,719
METHOD AND DEVICE FOR CONDITIONING FABRICS IN A TUMBLE-DRYER

James F. Davies; Arthur G. Leigh, and George K. Rennie, all of Merseyside, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 7, 1984, Ser. No. 586,957
Claims priority, application United Kingdom, Mar. 8, 1983, 8306308
Int. Cl.³ F26B 3/04
U.S. Cl. 34—12 31 Claims

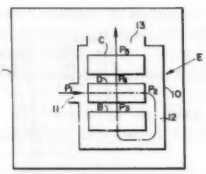


1. In a method of conditioning fabrics, which comprises tumbling damp fabrics under the action of heat in a laundry dryer together with a fabric conditioning agent in the form of a free-flowing powder having a particle size range within the range of from 20 to 1000 μm, the improvement wherein said powder includes at least 55% by weight of a blend of soaps of C_8 to C_{22} saturated or unsaturated fatty acids, said soap blend containing at least 5% by weight of C_{12} soap, at least 5% by weight of C_{14} soap, at least 12% by weight of C_{16} soap and at least 20% by weight of C_{18} soap, said soap blend being in the form of a powder free of any protective coating.

4,532,720
DRYING PROCESS AND ITS APPARATUS UTILIZING A REFRIGERATION CYCLE

Shiichiro Uchida, Fujisawa, Japan, assignor to Shonetsugaku Kenkyusho Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,035
Claims priority, application Japan, Nov. 2, 1982, 57-193072
Int. Cl.³ F26B 3/00
U.S. Cl. 34—27 1 Claim



1. A drying process utilizing a refrigeration cycle comprising the steps of:

supplying a part of hot air in a heat-insulated drying chamber having articles to be dried stored therein to a heat exchanger using an air suction or supply means to cool said air by heat exchange to between 25° and 35° C.;

cooling said air to between 5° and 15° C. by introducing said air into an evaporator to allow said air to be dried due to dehumidification by cooling;

guiding said dried air to said heat exchanger again to effect heat exchange for allowing said cooled and dried air to be heated by hot air in said drying chamber to between 35° and 50° C.;

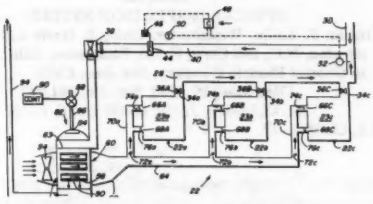
introducing said dried air into a heater to further heat said air to a temperature sufficient to maintain a temperature of 60° to 80° C. in said drying chamber; and

returning said dried and heated air to said drying chamber; whereby said articles stored in said drying chamber are dried by air circulation.

4,532,721
TEXTILE DRYER HEAT RECOVERY SYSTEM

James S. Gordon, Boston, Mass., assignor to MKF Energy Conservation Company, Manchester, N.H.

Filed Feb. 6, 1984, Ser. No. 577,179
Int. Cl.³ F26B 3/04, 21/12
U.S. Cl. 34—34 10 Claims



1. A method for drying a textile material in a textile heat recovery system, the system including a direct fired textile dryer and a heat exchanger, the textile dryer exhaust gas including dye residue, lint and combustion products, said method comprising the steps of:

(a) feeding the textile material to be dried into the textile dryer;

(b) drawing fresh air into the textile dryer;

(c) heating the fresh air drawn into the textile dryer; p1 (d) directing the exhaust gas containing dye residue and lint from the dryer to the heat exchanger;

(e) drawing fresh air into the heat exchanger;

(f) heating the fresh air drawn into the heat exchanger with the exhaust gas from the textile dryer, the heated fresh air being free of the exhaust gas; and

(g) sensing the temperature of the exhaust gas from the textile dryer;

(h) generating data signals representing the sensed textile dryer exhaust gas;

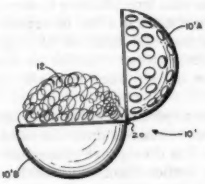
(i) controlling the flow of textile dryer exhaust gas directed to the heat exchanger as a function of the data signals; and

(j) directing the heated fresh air in the heat exchanger to the textile dryer as preheated fresh air.

4,532,722
FABRIC CONDITIONING DEVICE

Stephen H. Sax, 2402 - 3rd St., #101, Santa Monica, Calif. 90404

Continuation-in-part of Ser. No. 464,768, Feb. 7, 1983, abandoned. This application Oct. 31, 1983, Ser. No. 546,823
Int. Cl.³ F26B 19/00
U.S. Cl. 34—60 13 Claims



1. A device for dispensing a liquid fabric conditioner for use in an automatic laundry dryer for removing static cling from fabric articles being dried in the dryer, said dryer circulating

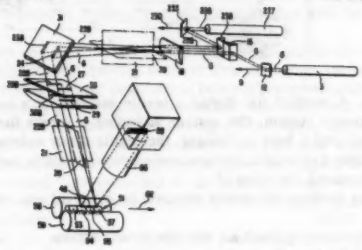
heated air through the fabric articles therein during the drying process, said device comprising: a reusable dispensing container having at least one opening therein; a quantity of absorbent material located within said container to be repeatedly impregnated with a liquid fabric conditioner; and a quantity of liquid fabric conditioner absorbed in said absorbent material to be vaporized by the heat of the dryer so that conditioning vapor is emitted through the opening of the container and into the dryer to condition the fabric articles in the dryer and remove static cling therefrom, whereby the user may apply a new quantity of liquid fabric conditioner to the absorbent material.

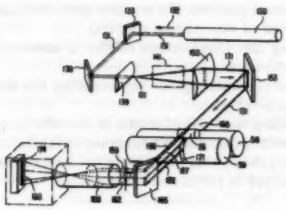
4,532,723

OPTICAL INSPECTION SYSTEM

Truman F. Kellie, Westchester, Ohio; J. David Landry, Wilmington, N.C., and Ching C. Lai, Pleasanton, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Mar. 25, 1982, Ser. No. 361,992
Int. Cl.³ G01N *21/89*; G01B *11/10, 11/30*
U.S. Cl. 356—73 **1 Claim**





1. Apparatus for the optical inspection of the surface, the diameter, the roundness and chamfer of each of a succession of substantially cylindrical, coaxially contiguous pellets spiraling about a common axis while advancing through a viewing field; said apparatus comprising:

first illumination means effective to project at least first and second laser beams in a first direction of propagation;

a first anamorphic lens effective to diverge said first and said second laser beams in a first divergence plane substantially parallel to said first direction of propagation;

first collimation means effective to reduce the amount of divergence of said laser beams in said first divergence plane;

a second anamorphic lens effective to converge said first and second laser beams in a direction substantially perpendicular to said first divergence plane, said second anamorphic lens being further effective to confine said beams to a first elongate region of illumination having a large length-to-width ratio on the surface of the pellets under examination;

first detector means including a linear array of first photoresponsive elements and a large aperture, flat field relay lens which directs light to said first elements, each of said first elements being adapted to provide an output signal representative of the amount of light reflected thereto, the light received by said first elements being reflected by corresponding subregions of said first region of illumination on the surface of the examined pellet, said first elements being positioned to receive reflected light only when the angle and the locus of reflection respectively within the corresponding sub-region remain within predetermined limits;

second illumination means effective to project a third laser beam in a second direction of propagation;

a third anamorphic lens effective to diverge said third laser beam in a second divergence plan substantially parallel to said second direction of propagation;

second collimation means effective to reduce the amount of divergence in said second divergence plane and to direct said third laser beam to a second region of illumination, said second region being an elongate area, with large height-to-width ratio, intersecting the whole diameter of each of said pellets in succession;

second detector means including a linear array of second photoresponsive elements each adapted to provide an output signal representative of the amount of transmitted light from said third laser beam incident thereon, said examined pellet occupying a portion of said second region of illumination between said second illumination means and said second detector means so as to eclipse part of said third laser beam and causing two disconnected portions of said third beam to be directed to said second elements;

whereby said first, second and third laser beams each have a substantially uniform spatial intensity distribution and

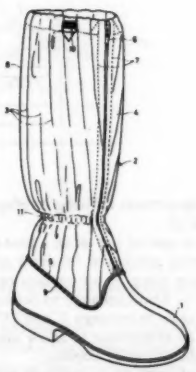
whereby said first output signals are representative of the condition of the surface of the examined pellet and said second output signals are representative of at least the diameter of said examined pellet transverse to said third laser beam.

4,532,724

ANTISTATIC FOOTWEAR

Koichi Okoshi, Tokyo, and Ryuichi Uematsu, Iwatsuki, both of Japan, assignors to Midori Anzen Industry Co., Ltd., Tokyo, Japan

Filed May 2, 1983, Ser. No. 490,776
Int. Cl.³ A43B *3/16*
U.S. Cl. 36—7.1 R **13 Claims**



1. Antistatic footwear comprising,

a shoe having a top portion with an upper edge and a sole assembly, said shoe being comprised of material having a predetermined electrical resistance to ground for regulating the discharge of static electricity from the body of the wearer,

a leg cover configured to encircle the leg of the wearer below the knee with the wearer's trousers being tucked between said cover and the encircled leg,

said leg cover being formed as a tubular body having an upper edge and being made of cloth threaded vertically with conductive fibers,

said leg cover having a lower edge portion affixed to said shoe and being comprised of electroconductive material so as to form an electric field between the leg cover and the encircled leg of the wearer and a conductive channel by corona discharge for controlled discharge of static electricity when the leg cover is worn around the leg of a wearer electrically charged with static electricity, and

means for maintaining the leg cover about the leg of the wearer, said means comprising an elastic strip inserted through the upper edge of said tubular body.

4,532,725

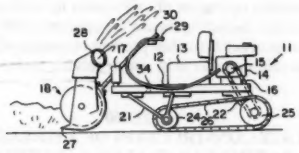
COMBINED SNOW PLOW, GRASS CUTTER & TILLER WITH ADJUSTABLE CHAIR

Jesse Trejo, and George Spector, both of 233 Broadway, Rm 3615, both of New York, N.Y. 10007

Continuation-in-part of Ser. No. 198,775, Oct. 20, 1980, abandoned. This application Jul. 19, 1984, Ser. No. 632,595

Int. Cl.³ E01H *5/09*

U.S. Cl. 37—243 **8 Claims**



1. A work apparatus, rideable by an operator, and having a center of gravity, and snow plow, lawn mower and roto-tiller attachments all being simultaneously mounted thereon for selective contact with a working surface, comprising:

(a) a frame;

(b) a plurality of attachments all being simultaneously mounted to said frame and including a snow plow, a lawn mower, and a roto-tiller;

(c) means for selectively activating each of said simultaneously mounted snow plow attachment, lawn mower attachment, and roto-tiller attachment between retracted and operated positions;

(d) a seat adaptable for the operator and mounted to said frame for movement through a plurality of positions; and

(e) means for connecting said moveable seat to said attachment actuating means, so that when said attachment activating means lowers a respective one of said plurality of attachments to said operated position said moveable seat automatically displaces towards said respective one of said plurality of attachments that is in said operated position so that the center of gravity of the work apparatus and the operator is shifted closer to said respective one of said plurality of attachments that is in said operated position and increases contact between said respective one of said plurality of attachments that is in said operated position and the working surface.

4,532,726

TICKET HOLDERS FOR SHELVING

Richard E. H. Kenney, 126 Furnival Rd., Toronto, Ontario, Canada M4B 1W8

Filed Sep. 12, 1984, Ser. No. 649,604

Claims priority, application United Kingdom, Feb. 20, 1984, 8404404

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—16.4 **4 Claims**

1. A ticket holder for shelving comprising a front support surface with parallel channels along opposed sides to receive a panel carrying pricing or other information, the rear of the holder having means for engagement with a ticket rail said means comprising integral formations defining a first pair of spaced parallel edges which can be relatively flexed to engage one within each of opposed parallel channels of a ticket rail, one of said edges being spaced with respect to a further formation at a side of the support surface so as to define therewith a further pair of spaced parallel edges which can be relatively flexed to engage the channels of a ticket rail, the support surface lying in one of two angled positions according to which pair of edges is engaged with the ticket rail.

4,532,727

FRAME, ESPECIALLY A QUICK-CHANGE FRAME FOR PHOTOGRAPHS

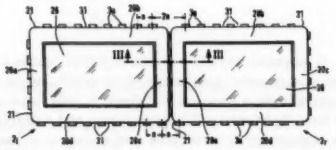
Odo Klose, Wupperal, and Jochen Jost, Essen, both of Fed. Rep. of Germany, assignors to FILMOSTO-PROJEKTION Johannes Jost GmbH & Co., Essen, Fed. Rep. of Germany

Filed Feb. 24, 1983, Ser. No. 469,530

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1982, 3206921; Apr. 6, 1982, 3212758

Int. Cl.³ A47G *1/06*

U.S. Cl. 40—152 **19 Claims**



1. A frame for receiving loose objects and for mounting same on a vertical wall, said frame having a circumferential outer margin in a frame plane and having at least partially straight margin sections, and having:

a substantially planar back wall having a front side;

a frame rim protruding from said back wall towards the front and laterally surrounding a frame inner field on the front side of said back wall; and

locking elements formed on at least part of the straight margin sections of the outer margin, said locking elements projecting outwardly from the outer margin in a uniform pattern substantially in the frame plane, adjacent locking elements formed on each straight margin section defining pair-wise an intermediate space for accommodating lock-

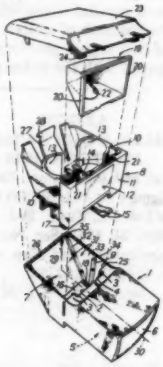
ing elements of like form, the pattern spacing n of said locking elements being such that the locking elements of one frame may engage the intermediate spaces between locking elements of a coupled adjacent frame forming a coupling seam between parallel straight margin sections of said coupled frames, the shape and arrangement of said locking elements being such that locked locking elements of two engaged frames can be disengaged only by movement of said frames in a direction perpendicular to said frame plane while said locking elements of said two engaged frames are non-disengageably interlocked in said frame plane in all directions, several locking elements being arranged in a pattern with uniform pattern spacing n in a row along each frame side, the locking element pattern spacing on aligned sides of coupled frames being continued beyond their coupling seam with the same pattern spacing n or an integral multiple of the spacing n, whereby a further frame may be coupled to the aligned sides of coupled frames in a position overlapping said coupling seam therebetween.

4,532,728

PORTABLE VIEWER FOR PHOTOGRAPHIC SLIDES

Patrick Posso, Lausanne, Switzerland, assignor to Posso S.A., Paris, France

Filed Jan. 31, 1984, Ser. No. 575,653
Claims priority, application France, Feb. 9, 1983, 83 02059
Int. Cl.³ G02B *27/02*
U.S. Cl. 40—367 **4 Claims**



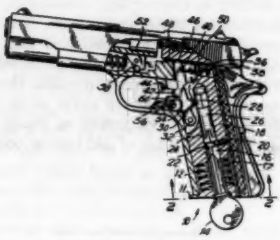
1. A portable viewer for photographic slides comprising a housing, a viewing lens mounted on said housing and defining an optical axis, a receptacle defined in said housing inward of said lens, light means for generating and supplying artificial light comprising a removable unit mounted in said receptacle and aligned with said lens along said optical axis, means for removably receiving and positioning a slide between said lens and said light means for illumination by said light means and viewing through said lens, a light reflecting surface aligned with said viewing lens inward of said light means removable unit, relative to said lens, and inclined at an acute angle to said optical axis, said light means removable unit, when mounted in said receptacle, being interposed between said light reflecting surface and said means for receiving and positioning a slide, and aperture means in said housing aligned with said light reflecting surface and laterally of said optical axis for a selective directing of light from a source remote from said housing to said light reflecting surface for reflection to said lens and along said optical axis upon removal of said light means removable unit, said light means removable unit being laterally slidable into and out of said housing through said aperture means.

4,532,729

FIREARM MAGAZINE LOCK

Francis Von Muller, 153 State St., Brooklyn, N.Y. 11201

Continuation-in-part of Ser. No. 183,426, Sep. 2, 1980, Pat. No. 4,384,420. This application Apr. 11, 1983, Ser. No. 483,782
Int. Cl.³ F41C *27/00, 17/08*
U.S. Cl. 42—1 LP **6 Claims**



1. In a firearm having receiving means for removably receiving a magazine containing cartridges, loading means for loading said cartridges in a firing chamber and trigger means for firing said cartridge, wherein the improvement comprises:

(a) a member adapted for use with said receiving means, and

(b) a means for coacting with said loading means in order to prevent operation of said firearm when said member is in said receiving means,

said means for coacting with said loading means further comprising a means for locking said member into said receiving means in order to prevent removal of said member,

said means for locking further comprising a lock means for preventing operation of said means for locking,

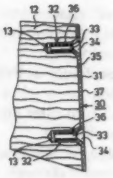
said member including means for coacting with said trigger means in order to further prevent operation of said firearm when said member is in said receiving means.

4,532,730

BUTT PLATE CONSTRUCTION OF A FIREARM AND IN PARTICULAR THAT OF A SHOTGUN

Timo Hyytinen, Jyväskylä , Finland, assignor to Valmet Oy, Finland

Filed Nov. 15, 1983, Ser. No. 552,076
Claims priority, application Finland, Nov. 16, 1982, 823924
Int. Cl.³ F41C *23/00*
U.S. Cl. 42—73 **12 Claims**



1. In a weapon adapted to be fired from the shoulder, such as a shotgun or the like, including a stock having a rearward end face, a butt assembly adapted to be coupled to the end face of the stock, comprising:

a body member mounted on the rearward end face of the weapon stock, said body member incluidng a plate-like portion having a forward face and body member mounting means for mounting said body member on said stock with said forward face of said plate-like portion being in relatively continuous surface engagement with the rearward end face of the stock, said body member mounting

means including substantially tubular mounting studs integral with said plate-like portion and projecting forwardly therefrom, said mounting studs extending into respective first bores formed in the weapon stock which open onto the rearward end face thereof to mount said body member thereon, each tubular mounting stud defining an interior second bore within it; and

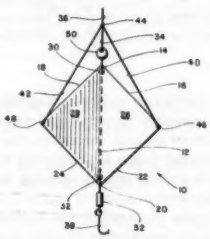
a butt plate mounted on said plate-like portion of said body member by butt plate mounting means, said butt plate mounting means including third bores formed in said butt plate, each third bore of said butt plate mounting means being in aligned relationship with a second bore defined by a respective one of said tubular mounting studs of said body member which extends into a respective one of said first bores formed in the weapon stock, said butt plate mounting means further including threaded fastener members extending through respective aligned third and second bores of said butt plate and mounting studs into respective first bores of the weapon stock.

4,532,731

FISHING LINE HEIGHT ADJUSTER AND FRICTION SLIDER

Robert Wheeler, 823A E. Gulf Blvd., Indian Rocks Beach, Fla. 33535

Filed Mar. 25, 1983, Ser. No. 478,682
Int. Cl.³ A01K *91/04, 93/00*
U.S. Cl. 43—43.13 **14 Claims**



1. A trolling depth adjusting device, comprising:

a vane having a generally square shape which is bent at an upwardly facing oblique angle along a diagonal bend axis between a forwardly directed corner formed by first and second sides of said square and an aftwardly directed corner formed by third and fourth sides of said square, forming a first upwardly facing vane surface bounded by said diagonal bend and said first and third sides and forming a second upwardly facing vane surface bounded by said diagonal bend and said second and fourth sides, said forwardly directed corner having a first hole therethrough and said aftward corner having a second hole therethrough;

a principal line having an upper end connected to a trolling line having a pulling force direction, passing from the upward facing surface of said vane, slideably through said first hole in said forwardly directed corner to the underside of said vane and then passing from said underside, slideably through said second hole in said aftwardly directed corner and terminating in a lower end connected to a fishing hook;

a first and second stabilizing lines fastened to a tie point at said upper end of said principal line, said first stabilizing line being fastened to a third corner of said vane formed by said first and third sides of said square and said second stabilizing line being fastened to a fourth corner of said vane formed by said second and fourth sides of said square;

a weight slideably mounted on said principal line between said tie point and said first hole in said vane;

an adjustable stop mounted on said principal line between said lower end thereof and said second hole in said vane;

said weight forcing said vane to slide downwardly on said principal line toward said stop when the tension between said trolling line and said hook is relatively low, causing said diagonal bend axis of said vane to be disposed at an acute attack angle with respect to said pulling force direction of said trolling line, enabling said first and second upwardly facing vane surfaces to apply a downwardly directed reactive force on said trolling line as said vane is pulled through the water;

said first and second stabilizing lines and said principal line forcing said vane to slide upwardly on said principal line toward said tie point when the tension between said trolling line and said hook is relatively high, causing said diagonal bend axis of said vane to be disposed in an approximately parallel orientation with respect to said pulling force direction of said trolling line, enabling said vane to apply a substantially lower reactive force on said trolling line as said vane is pulled through the water;

whereby a hooked fish can be more easily retrieved.

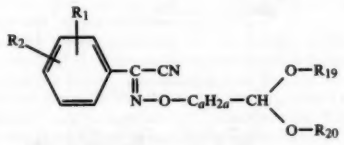
4,532,732

OXIME DERIVATIVES FOR PROTECTING PLANT CROPS

Henry Szczepanski, Wallbach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 238,345, Feb. 26, 1981, Pat. No. 4,468,242, which is a division of Ser. No. 69,414, Aug. 24, 1979, Pat. No. 4,269,775. This application Feb. 1, 1982, Ser. No. 344,708
Claims priority, application Switzerland, Sep. 1, 1978, 9252/78
The portion of the term of this patent subsequent to Feb. 5, 2002, has been disclaimed.
Int. Cl.³ A01N *25/32*
U.S. Cl. 47—57.6 **169 Claims**

1. A composition for protecting sorghum, rice and barley crops gainst the action of 1,3,5-triazine, haloacetanilide or phenoxyphenoxypropionate herbicides which comprises (1) a crop protecting effective amount of a compound of the formula



wherein,

R_1 is hydrogen, methyl, methoxy, chlorine, cyano or trifluoromethyl,

R_2 is hydrogen or chlorine, or

R_1 and R_2 taken together is —CH=CH—CH=CH— attached to adjacent carbon atoms in the ring,

a is 1 or 2, and

R_{19} and R_{20} are each methyl, or ethyl

R_{19} and R_{20} taken together is C_2–C_7 alkylene having 2 or 3 carbon atoms in its principal chain and (2) a carrier.

4,532,733

IN VITRO PROPAGATION OF GRAPE

William R. Krul, Narragansett, R.I., assignor to The Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, both of Providence, R.I.

Filed Dec. 3, 1982, Ser. No. 446,442
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—58 **5 Claims**

1. A method for controlling the growth of plant embryos for

either self-replicative or vine development modes, which includes:

(a) initiating somatic embryogenesis by placing somatic embryos in a medium conducive for self-replication of the embryos for a first period of time during which the embryos germinate and are characterized by late torpedo stage embryos prior to root and shoot elongation;

(b) culturing for vine development at least some of the embryos of step (a) in a medium having cytokinin activity for a second period of time at the end of which time the embryos are characterized by green divided cotyledons;

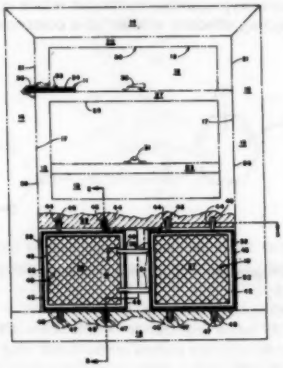
(c) transferring the embryo of step (b) to a medium free of cytokinin activity until such time that they develop sufficiently for transfer to a non-agar growth support medium.

4,532,734

WINDOW INTRUSION BARRIER

Isidore Jokel, 4201 Newport H, Deerfield Beach, Fla. 33441

Filed Jan. 25, 1984, Ser. No. 573,855
Int. Cl.[3] E06B 3/68
U.S. Cl. 49—55 **5 Claims**



1. A safeguard system for a window comprising:

(a) a barrier apparatus of adjustable horizontal length adapted for insertion into a window casement below a framed rectangular window slideably positionable within said casement, said barrier apparatus comprising:

(1) two gridwork panels,

(2) two rigid rectangular frames adapted to border and support said panels, each frame comprising horizontally disposed upper and lower borders, inner and outer vertically oriented side borders, and vertically spaced apertures in at least one inner side border,

(3) vertically oriented seating posts affixed to the upper and lower borders of said frames in substantially coplanar disposition with said frames and directed exteriorly therefrom,

(4) horizontally oriented mating posts affixed to the inner vertically oriented side border of one of said frames and adapted to slideably penetrate the vertically spaced apertures of the inner vertically oriented side border of the other frame, and

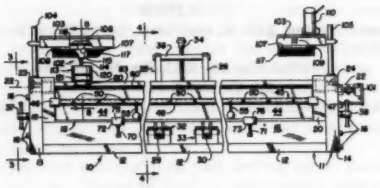
(b) locking means for immobilizing said slideably positionable window with respect to said casement.

4,532,735

VARIABLE ANGLE EXTRUDER BLADE SURFACING MACHINE

Harold P. Dahlgren; James E. Taylor, both of Dallas; Dwight W. Peters, Grapevine, and Donald R. Selby, Duncanville, all of Tex., assignors to Dahlgren Manufacturing Company, Dallas, Tex.

Filed Apr. 26, 1982, Ser. No. 371,521
Int. Cl.[3] B24B 9/04
U.S. Cl. 51—56 R **14 Claims**



1. A blade surfacing machine comprising: a frame; a work table; means movably securing said work table to said frame for rotation about an axis; means to clamp a blade to be surfaced on said work table; a guide plate having a planar guide surface lying in a plane; means securing said guide plate to said frame for transverse movement relative to said axis; means for moving said guide plate relative to a blade on said work table in a direction perpendicular to said axis a honing member having a major portion of a planar honing surface in engagement with said planar guide surface on said guide plate; and means positioning said work table and said guide plate such that a blade clamped to said work table is engaged by the planar surface on the honing member upon movement of the honing member relative to the guide plate.

4,532,736

SHARPENING DEVICE

Harold C. Shinneman, Jr., 890 Fremont La., Lake Havasu City, Ariz. 86403; Edward J. Rebish, 1804 Glenridge Rd., Euclid, Ohio 44117, and Harold C. Shinneman, Sr., 3400 Roadrunner Dr., Lake Havasu City, Ariz. 86403

Filed Oct. 4, 1982, Ser. No. 432,633
Int. Cl.[3] B24B 9/04
U.S. Cl. 51—218 A **11 Claims**

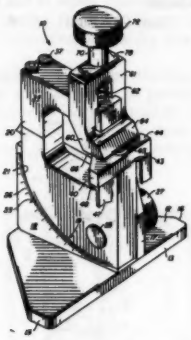
1. A freestanding manually operable clamping device for use in sharpening a workpiece in conjunction with a rotary grinding wheel having a horizontal centerline, said device comprising:

(a) a fixed base member;

(b) a fixture frame having a fixed jaw member and a moveable jaw member oppositely disposed one to the other at a forward location on said frame and each said jaws having a workpiece engaging surface and a front edge which will face the grinding wheel, one of which surfaces being positionable at the approximate horizontal centerline of the grinding wheel, said moveable jaw being adjustable to vary the space between the surfaces of the fixed jaw and the moveable jaw, one of said jaws being pivotal relative to the other jaw to vary the included angle between the

workpiece engaging surfaces, said frame and jaws providing clearance laterally and to a location rearward of said jaws;

(c) said fixture frame and base defining cooperating arcuate surfaces, said arcuate surfaces being defined by a radius of



curvature from a center point located forward the front edge of said jaws along said one of said surfaces whereby the edge to be sharpened will be presented to the wheel at a correct pre-set angle;

(d) locking means for selectively securing said fixture frame in a predetermined fixed position relative to said base.

4,532,737

METHOD FOR LAPPING DIAMOND

Herbert I. Moss, Yardley, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 16, 1982, Ser. No. 450,197

Int. Cl.³ B24B *1/00*; B24D *3/34*

U.S. Cl. 51—283 R **10 Claims**

1. In a method for lapping a diamond which comprises coating a lapping disc with an abrasive slurry, positioning the diamond to be lapped in direct contact with the work surface of the lapping disc, and establishing relative motion between the disc and the diamond; the improvement which comprises:

employing a lapping disc whose work surface is fabricated from a ternary alloy comprising from about 2–20% by weight of aluminum, about 2–20% by weight of silicon and the balance iron.

5. A lapping disc for lapping a diamond comprising a disc having a work surface thereon, which work surface is coated with an abrasive slurry, wherein the work surface of the disc comprises a ternary alloy of about 2–20% by weight of aluminum, about 2–20% by weight of silicon and the balance iron.

4,532,738

METHOD OF REMOVING A COATING

David F. Sippel, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 19, 1983, Ser. No. 562,609

Int. Cl.³ B24C *1/00*

U.S. Cl. 51—319 **10 Claims**

1. A method of removing a selected coating from an article surface having a composition different from the coating, by impacting the coating with abrasive particles and concurrently inspecting the surface to determine that the coating has been removed, the coating being capable of emitting light in an impact intensity range, the steps of:

impacting the coating with abrasive particles in the impact intensity range and concurrently observing the light emitted as a first color;

selecting from the light spectrum a second color which provides a color contrast between the first color of light emitted from the coating and light reflected from the article surface during coating removal in the impact intensity range;

providing a light environment of the selected color;

placing the coated article surface in the light environment; and then,

impacting the coating with the abrasive particles in the impact intensity range to create the color contrast and to remove coating from the article surface, the impacting being conducted until the color contrast disappears.

4,532,739

ROOF RIDGE CAPPING SYSTEM

Christopher A. Cooper, Cranbrook, England, assignor to Marley Tile A.G., Switzerland

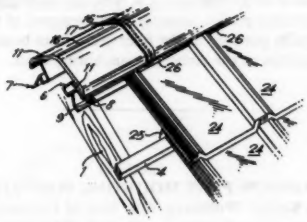
PCT No. PCT/GB80/00204, § 371 Date Mar. 9, 1982, § 102(e) Date Mar. 9, 1982, PCT Pub. No. WO82/00314, PCT Pub. Date Feb. 4, 1982

PCT Filed Nov. 28, 1980, Ser. No. 355,745

Claims priority, application United Kingdom, Jul. 23, 1980, 8024104

Int. Cl.³ E04D *1/30, 3/40*

U.S. Cl. 52—57 **7 Claims**



1. In a roofing structure, a system for attaching conventional ridge tiles along a ridge of the roofing structure, comprising:

(a) a pair of elongated members, each elongated member having a top flange, secured to the roofing structure adjacent to and on either side of the ridge such rigid conventional ridge tiles may be placed on the elongated members, such that they bear against an upper surface of the top flange and extend over the ridge; and,

(b) locating means extending over a portion of the rigid conventional tile from one elongated member to the other, the locating means comprising a strap element having at each end thereof inwardly curved portions which snap-fit in direct contact together with respective top flanges of the elongated members to retain the conventional tiles in position over the ridge.

4,532,740

ANCHORING TRACK WITH REMOVABLE FILLER BODY

Siegfried Fricker, Wurmberger Str. 30-34, 7135 Wiernsheim, Fed. Rep. of Germany

Filed Apr. 30, 1984, Ser. No. 605,695

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 33156328

Int. Cl.³ E04B *1/41*

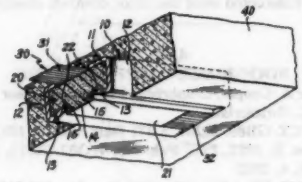
U.S. Cl. 52—98 **12 Claims**

1. An anchoring track adapted to be embedded in the surface of a structural member of cast concrete or a comparable mortar-cast material for the suspension thereon and/or attachment thereto, in a fixed or longitudinally displaceable relationship, of a object with the aid of at least one anchoring member which is received in the anchoring track behind oppositely facing flange portions of the track profile, the anchoring track comprising in combination:

an anchoring track body in the form of a continuous profile

defining a generally C-shaped cross section, said oppositely facing flange portions flanking a central longitudinal slot facing away from the surrounding surface of the structural member;

a filler body received inside the anchoring track profile, the cross section of the filler body matching the interior cross section of the anchoring track profile, so as to fill out the



latter and to close off both extremities of the anchoring track profile against the penetration of mortar during the embedding operation; and

means for tearing a central profile portion of the filler body out of the anchoring track, through the longitudinal slot of the track profile, so as to permit removal of the remaining profile portions of the filler body from behind the flange portions of the embedded anchoring track.

4,532,741

WINDOW PANE MOUNTING FOR VEHICLES

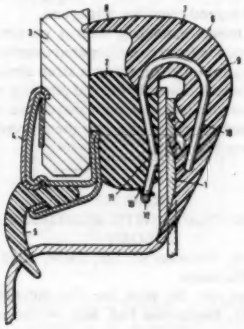
Günter Knüdel, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,546

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332233

Int. Cl.³ B60J *1/00*

U.S. Cl. 52—99 **1 Claim**



1. A window pane mounting for a vehicle comprising:

a flange extending approximately parallel to the adjacent surface of a window pane and forming a window opening;

a cement bead disposed between the flange and the adjacent surface of the window pane to support the window pane;

a resilient molding mounted on the flange and having support elements projecting through the cement bead to the opposite side thereof; and

a flexible wire joining the portions of the projecting elements on the opposite side of the cement bead.

4,532,742

EXTENDIBLE STRUCTURE

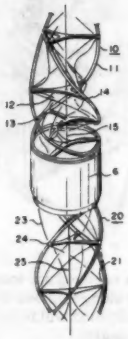
Koryo Miura, 9-7, Tsurukawa 3-chome, Machida-shi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha and Koryo Miura, both of Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 539,949

Claims priority, application Japan, Oct. 9, 1982, 57-178196; Mar. 2, 1983, 58-34168

Int. Cl.³ E04H *12/18*

U.S. Cl. 52—108 **9 Claims**



1. An extendible structure, comprising in combination:

(a) three or more numbers of extendible longerons;

(b) a plurality of joints provided on each of said longerons at predetermined space intervals along them;

(c) a plurality of integrated radial spacers, each having a plurality of legs integrally formed with said spacer and radially extending from the center part thereof, each leg being rotatably connected with said joint provided at differing position on each of said longerons; and

(d) a plurality of bridles for connecting one of said joints with adjacent another joint at a diagonally opposed position,

in the extended condition of said extendible structure, said three or more longerons being deployed in parallel one another with space intervals among them in the lateral direction which intersects with the direction of extension of said longerons, said spacers supporting said longerons with the horizontally spaced interval within a plane substantially perpendicular to the direction of extension of said longerons, and said bridles being extended to impart the tensile force between the joints which are at the diagonally opposed positions, and

in the collapsed condition of said extendible structure, each of said longerons being collapsed in a loop form, and said spacers being laid one upon another inside said loop formed by said longerons.

4,532,743

SLIDING DOOR ASSEMBLY

Alexander Miller; James E. Sweetman, and Douglas J. McDougall, all of 16295 NW. 13 Ave., Miami, Fla. 33169

Filed Jan. 31, 1983, Ser. No. 462,616

Int. Cl.³ E06B *1/04*

U.S. Cl. 52—207 **7 Claims**

1. A sliding door assembly of the type including at least a stationary panel and a movable panel, said door assembly comprising:

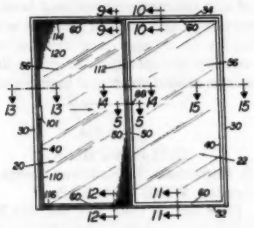
(a) a track assembly extending across a doorway and formed at least in part from extruded material and disposed in supporting relation to said panels,

(b) both said stationary and movable panels comprising an interlocking rail defining a lateral peripheral portion of each panel,

(c) said interlocking rails correspondingly configured and including a mating portion each of which is disposed in substantially mating engagement with one another when said panels are disposed in a closed position along the length of said track assembly,

(d) each mating portion comprising two flange elements spaced outwardly from a remainder of said respective interlocking rail and in offset, non-coplanar, spaced apart relation to one another, said two flange element of each interlocking rail extending outwardly in a common direction,

(e) said flange element of each interlocking rail being reversely oriented and disposed in parallel, substantially overlapping relation to correspondingly disposed flange elements of the other of said interlocking rails when said panels are disposed in said closed position,



(f) a lock assembly mounted on one of said interlocking rails and including a rod element rotatable about its own longitudinal axis and including a distal end portion transversly oriented relative to a length of said rod element and rotatable therewith,

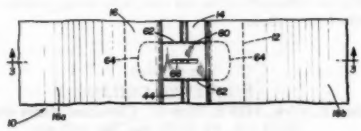
(g) said rod element extending into said one interlocking rail in substantially underlying relation to one flange element thereof, said distal end dimensioned and disposed for selective positioning into and out of blocking engagement with a correspondingly positioned and overlapping flange of the other of said interlocking rails, when said panels are in said closed position, upon rotation of said rod element, and whereby relative movement between said panels out of said closed position is prevented when said distal end is in said blocking position.

4,532,744

LOCKING DEVICE FOR MEMBRANE FASTENER APPARATUS

Heinz W. Beneze, Akron, and Walter Tomaszewski, Canton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 6, 1983, Ser. No. 529,468
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—222 **12 Claims**



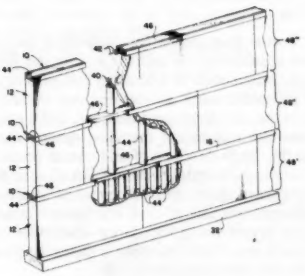
1. In an attachment device in combination with a roof and at least one elastic membrane for mechanically securing said membrane to the upper surface of said roof, said attachment device comprising channel member having a generally rectangular cross-section and a continuous, central longitudinal slot opening into said channel member, a bottom wall, an upper wall, and generally opposed sidewalls, said channel member having a width which is defined by said opposed sidewalls; and an insert member comprising means for maintaining said at least one elastic membrane within said channel member, said insert member having an integral central longitudinal portion and two adjacent wing portions located on opposed edges of said central longitudinal portion, said central longitudinal portion defining said two adjacent wing portions, said insert member being either substantially flat or slightly concave and comprising means for frictionally and non-bindingly maintaining said at least one elastic membrance against one wall of said channel member, thereby permitting lateral and vertical shifting of said insert member and said at least one elastic membrane within said channel member, said insert member having a width which is less than said channel member width; one of said insert and channel members being capable of deformation to permit the insertion of said channel member, the improvement comprising the addition of an independent locking device, into said channel member to prohibit the subsequent removal of said elastic membrane by elastic deformation of one of said channel and insert members.

4,532,745

CHANNEL AND FOAM BLOCK WALL CONSTRUCTION

George P. Kinard, Arvada, Colo., assignor to Core-Form, Broomfield, Colo.

Filed Dec. 14, 1981, Ser. No. 330,174
Int. Cl.³ F04B *2/24*
U.S. Cl. 52—251 **32 Claims**



1. A wall structure, comprising:

a plurality of foam plastic blocks, each block having a length and a height and a width dimension, each block having a top and a bottom surface extending in the longitudinal and width dimensions and separated from one another by the height dimension, each block positioned in said wall structure with its height dimension extending generally vertically and its longitudinal and width dimensions extending generally horizontally, each block having within its interior a plurality of block openings extending between its top and bottom walls, each of the block openings located at predetermined locations in the top surface along the longitudinal dimension of the block;

a channel member abutting the top surface of each block along substantially the full extent of the longitudinal dimension of each block, said channel member comprising a bottom wall and a pair of side walls extending upward from the bottom wall, the channel member thereby defining a U-shaped channel between the side walls and the bottom wall, the bottom wall having a configuration adapted to generally mate with the top wall of each block, said bottom wall having a plurality of channel openings therethrough at predetermined locations which correspond with the predetermined locations of the block openings in the top surface of each block with which the top surface mates, said side walls characterized by the capability to receive and retain fasteners inserted therein from an exterior surface extending in the height and length dimen-

sions of said wall structure, the fasteners adapted for attaching construction elements to said wall structure; and load-bearing concrete substantially occupying the block and channel openings and the U-shaped channel.

4,532,746

CORNER JOINT MEANS FOR USE IN WALL STRUCTURE OF BUILDINGS

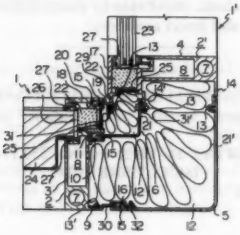
Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 1, 1983, Ser. No. 519,197

Claims priority, application Japan, Aug. 10, 1982, 57-121467[U]

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—276 **3 Claims**



1. A corner joint means for connecting two wall members disposed adjacent to one another at a corner portion of a curtain wall construction of a building comprising a pair of foundation assemblies each having one end thereof fixedly connected to the associated wall member, and a plurality of separate plate-like attachment members spaced apart from each other in the depth direction of said corner portion and extending between said foundation assemblies so as to define therebetween a corner space enclosed between said two wall members, wherein one end of each attachment member is fixedly connected to one of said foundation assemblies while the other end of each attachment member is slideably connected to the other of said foundation assemblies.

4,532,747

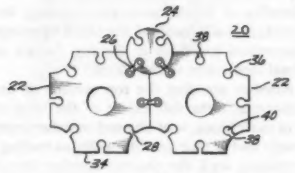
EXPANDABLE CONNECTOR AND METHOD OF USING SAME TO FORM CURVED STRUCTURAL FRAMEWORK

John R. Koetje, 1314 McLean Rd., Mount Vernon, Wash. 98273

Filed Jan. 20, 1983, Ser. No. 459,326

Int. Cl.³ E04C *1/10*

U.S. Cl. 52—586 **6 Claims**



1. A structural framework, comprising:

a plurality of elongate structural member means secured together in side-by-side relationship, each of said structural member means including a plurality of slots extending along the length of said structural member means with at least one of said slots in opposed alignment with a slot of an adjacent structural member means, each of said slots having a mouth portion intersecting an adjacent outer surface of said structural member means and a generally circular base portion intersecting the side of said slot mouth portion opposite said structural member means outer surface, said slot base portion in cross section being of a diameter larger than the width of said slot mouth portion; and

a unitary fastener member disposed within and extending between said aligned slots, said fastener member having a central portion of a width closely corresponding to the width of the mouth portions of the pair of aligned slots and generally circular end portions at each end of the central portion, each of said end portions being:

nominally, substantially smaller in diameter than the corresponding base portions of said structural member means slots; and,

defined by a generally circular, circumferentially continuous bore extending through each end portion and along the length of said fastener member, said bores being enlarged after insertion of said fastener member within said aligned slots thereby to expand said circular end portions to snugly occupy substantially the entire diameters of said base portions of said structural member means slots.

4,532,748

BUILDING BLOCK

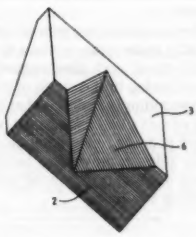
William D. B. Rotherham, 18 Hamilton House, 81 Southhampton Row, London, WCIB 4HA, England

Filed Jan. 3, 1983, Ser. No. 455,287

Claims priority, application United Kingdom, Jan. 6, 1982, 8200228

Int. Cl.³ E04B *5/04*

U.S. Cl. 52—605 **16 Claims**



1. A building block having a shape derived from that of a cuboid and having top, bottom, front and rear faces and upper and lower corners, wherein the upper corners of the front face of the cuboid are cut away, part of the top face being left intact, and wherein a recess communicates between the bottom face and the rear face only, part of the bottom face and the lower corners of the rear face being left intact, the sum of the depth to which said upper corners are cut as measured from said front face and the depth to which the recess extends forwardly as measured from the rear face being greater than the depth of the cuboid.

4,532,749

LOUVERED CEILING

William E. Perk, 3419 E. 65th St., Cleveland, Ohio 44127

Filed Feb. 17, 1983, Ser. No. 467,446

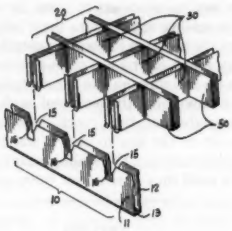
Int. Cl.³ E04C *2/42*

U.S. Cl. 52—668 **9 Claims**

1. In a louvered ceiling having at least one runner of upwardly open first channel section, comprising a first sidewall, a second sidewall and a first base wall joining said sidewalls, and having a louver adapted to be supported on said runner and comprising at least one upwardly open channel member having a third sidewall, a fourth sidewall and a second base wall joining said sidewalls, the improved assembly comprising

a substantially planar tab or tabs joined to the end of at least one of said sidewalls of said channel member along an upper length thereof, said length extending downwardly from the top of said end to a point above the bottom of said end; each of said tab or tabs extending from said end of said sidewall in a direction perpendicular to that sidewall and away from the other sidewall;

each of said tab or tabs defining one edge of a first slot between said end of said sidewall and said tab, said first slot extending upwardly from the lowermost portion of said tab to said point along said upper length along which said tab is joined to said end;



a downwardly extending second slot disposed in said first sidewall of said runner, said second slot having an outwardly widened upper portion and having a narrowed portion, said narrowed portion being of such width as to firmly but slidingly accommodate said sidewall or sidewalls of said second channel member which are provided with said tab or tabs;

said second slot being sufficiently narrow at all points so that when said sidewall or sidewalls of said second channel member which are provided with said tab or tabs are inserted into said second slot, the open area defined by said second slot is entirely overlapped by the combined areas of said tab or tabs and the space between said third and fourth sidewalls.

4,532,750

WINDING BODY FOR WINDING-UP CONTINUOUSLY ARRIVING FLAT STRUCTURES, ESPECIALLY PRINTED PRODUCTS IN AN IMBRICATED PRODUCT FORMATION

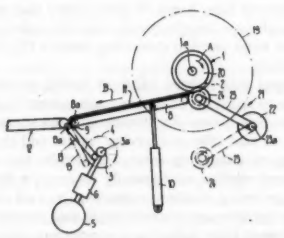
Jacques Meier, Büretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Aug. 30, 1982, Ser. No. 412,843

Claims priority, application Switzerland, Sep. 18, 1981, 6047/81

Int. Cl.³ B65B *63/04*

U.S. Cl. 53—118 **18 Claims**



1. A winding body arrangement for winding-up continuously arriving substantially flat structures, particularly printed products, especially arriving in an imbricated product stream, comprising:

a winding body having a substantially cylindrical jacket;

at least one winding band interposed at the wound-up imbricated product stream;

storage means for the winding band arranged internally of said jacket of said winding body;

said jacket having an opening for the infeed and outfeed of said winding band;

drive means for outfeeding and again infeeding for storage at said storage means the winding band through said opening of said jacket of said winding body;

said storage means comprises a rotatably mounted and arrestable band spool which can be operatively coupled with said drive means;

a rotatable drive element with which there is rigidly connected for rotation said band spool; and

a drive member for driving said drive element.

4,532,751

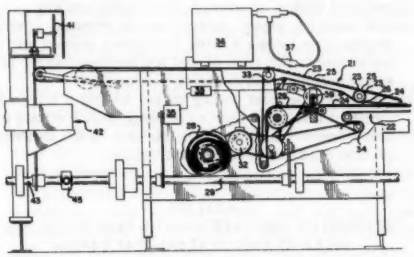
AUTOMATIC SHEET PRODUCT LINE

Timothy G. Mally, Oregon; James A. Rattmann, Sun Prairie, and Alvin Borsuk, Madison, all of Wis., assignors to Oscar Mayer Foods Corp., Madison, Wis.

Filed Apr. 16, 1984, Ser. No. 600,702

Int. Cl.³ B26D *5/00, 7/28*

U.S. Cl. 53—396 **28 Claims**



17. A method for automatically forming and stacking sheet products, comprising:

feeding a substrate web to a web cutting location;

providing a conveyed flow of products having a preselected spacing pattern including a gap between a grouping of said products;

monitoring said conveyed flow of products and signaling severance of the substrate web to a pre-cut substrate length defined by severance gaps;

providing the pre-cut substrate length to a substrate supply assembly in timed sequence with the conveyed flow of products;

operatively intersecting the pre-cut substrate with the conveyed flow of products, said timed sequence being such that said grouping of products is deposited onto the pre-cut substrate length and such that the gap between the grouping of products generally coincides with one of the severance gaps, thereby forming a sheet product;

conveying a flow of said sheet products for reducing the rate of flow thereof; and

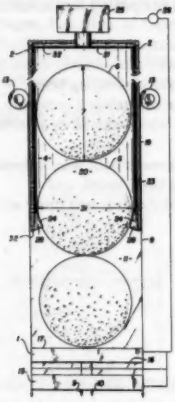
stacking the reduced rate flow of sheet products into a stack of a plurality of sheet products.

4,532,752

PRODUCT INDEXING DEVICE

Monroe F. Taylor, Greenville, S.C., assignor to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Filed Sep. 27, 1983, Ser. No. 536,412
Int. Cl.³ B65B 9/10, 35/12
U.S. Cl. 53—451 **11 Claims**



1. In a vertical form, fill, and seal machine for individually packaging relatively heavy articles such as grapefruit and the like, the improvement comprising:

a substantially vertical mandrel means having an upper entrance orifice, an interior, and a lower orifice;

article indexing means comprising an inverted U-shaped flexible strip having a cross connecting portion and two leg portions with each of said leg portions having lower article retaining and engaging portions; and

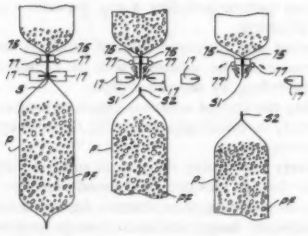
upper transverse heat sealing means having a top surface located a distance below a discharge orifice of said mandrel wherein said distance is less than twice an average vertical thickness of one of said articles.

4,532,753

METHOD OF AND APPARATUS FOR FORMING, FILLING AND SEALING PACKAGES

Lloyd Kovacs, Sheboygan, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed Feb. 18, 1983, Ser. No. 467,595
Int. Cl.³ B65B 9/06
U.S. Cl. 53—451 **10 Claims**



1. The method of forming, filling, and sealing packages comprising:

forming flexible packaging material into tubing, the tubing extending downwardly;

feeding the tubing downwardly and heat sealing it to form transverse seals spaced at package length intervals, the seals being formed by a pair of sealing members movable relative to one another between a fully open position and a closed position in sealing engagement with the tubing; and

delivering a quantity of the product with which the packages are to be filled into the tubing to provide a fill for each package;

wherein the improvement comprises:

pinching the tubing closed above the sealing members after the tubing has been fed downwardly each package length interval and following the completion of the delivery of the fill for the next package to be formed, thereby to keep product for the next fill from dropping down in the tubing onto the next seal;

closing the sealing members to form the next seal;

opening the sealing members to their fully open position;

maintaining the pinch as the sealing members open generally until they reach their fully open position;

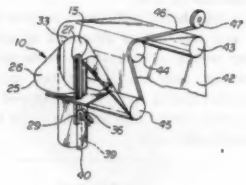
and, while so maintaining the pinch to keep product from dropping down onto the next seal as the sealing members open generally until they reach their fully open position, blowing air on the seal to cool it starting with the initial opening movement of the sealing members and continuing generally until they reach their fully open position.

4,532,754

TUBE FORMER APPARATUS

Ronald A. Hokanson, Pasadena, Tex., assignor to Formers of Houston, Inc., Pasadena, Tex.

Filed Apr. 20, 1983, Ser. No. 486,942
Int. Cl.³ B65B 9/00, 61/18
U.S. Cl. 53—451 **13 Claims**



6. A packaging apparatus including a winged tube former for forming strip tube stock into a tube on being drawn thereover, and laterally extending, spaced heat seal bars and a cutter positioned therebetween, positioned beyond said tube former, operable to produce lateral end seals converting the tube into bags, forming a top seal on one bag and a bottom seal on another bag and cutting between the seals to sever one bag from the other, in which

said former includes a former tube having a curved upper edge tapering from an apex downwardly on opposite sides thereof,

said former tube being of sheet metal and separated at one side along a longitudinally extending line with the lowermost edge portion extending behind the uppermost edge portion,

a winged guide sheet, of sheet metal, secured around said tube to said curved upper edge thereof to define a crown extending outwardly therefrom at an acute angle from the side of said tube and having longer and shorter side wing portions extending around said tube and overlapping in spaced relation substantially to the side thereof with said longer wing portion extending to said tube lowermost edge portion and curved inside said shorter wing portion,

said former tube including a supporting base on which said former tube and winged guide sheet are secured and being supported in said apparatus with said overlapping wing portions being at the side of said former tube and to the

side of the tube stock strip being formed into a tube so that a strip of thin tube stock drawn over said winged guide sheet and through said former tube will be formed into an elongated tube with overlapping edges at the side of the tube and on seaming and flattening in a direction from front and back relative to said former tube will have the longitudinal seam at the side of the flattened tube with the shorter portion of the tube wall overlying the longer portion of the tube wall, and said apparatus including

means for applying a narrow double sided adhesive strip to one edge of the strip tube stock forming said overlapping tube portion,

a backing member positioned beyond said former tube in the path of movement of said overlapping tube portion, a pressure member cooperable with said backing member positioned to press said overlapping tube portion and adhesive strip to form a releasable side seam, and

said heat seal bars being positioned to flatten said tube to form said lateral seals with said longitudinal seam positioned substantially at the side and the shorter edge of said tube outside the longer edge of said tube.

8. A method of producing packages from thin tube stock which comprises

passing a strip of thin tube stock over a winged tube former which comprises

a former tube having a curved upper edge tapering from an apex downwardly on opposite sides thereof,

said former tube being of sheet metal and separated at one side along a longitudinally extending line with the lowermost edge portion extending behind the uppermost edge portion,

a winged guide sheet, of sheet metal secured around said former tube along said curved upper edge and extending outwardly therefrom at an acute angle from the side of said tube,

said winged guide sheet having longer and shorter end portions in spaced overlapping relation at one side of said tube and spaced apart with said longer end portion extending to said tube lowermost edge portion and curved inside said shorter end portion,

said former tube including a supporting base on which said former tube and winged guide sheet are secured and being adapted to be supported in a tube forming apparatus with said overlapping wing portions being at the side of said former tube and to the side of the tube stock strip being formed into a tube so that a strip of tube stock drawn over said winged guide sheet and through said former tube will be formed into an elongated tube with overlapping edges at the side of the tube and on seaming and flattening in a direction from front and back relative to said former tube will have the longitudinal seam at the side of the flattened tube with the shorter portion of the tube wall overlying the longer portion of the tube wall,

and through said former tube so that said thin tube stock forms a tube with an overlapping portion substantially to the side thereof with the shorter portion of the tube wall overlying the longer portion of the tube wall,

applying a narrow double sided adhesive strip to one edge of said strip before passing over said former whereby said overlapping portion has said adhesive strip positioned therebetween,

moving said overlapping tube portion between a backing member positioned beyond said former tube and a pressure member positioned to press said overlapping tube portion and adhesive strip thereagainst to form a releasable side seam,

flattening said tube with said seam at the side and passing the flattened tube between laterally extending, spaced heat seal bars with a cutter positioned therebetween in a direction from front and back relative to said former tube,

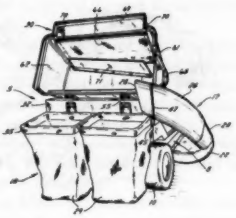
operating said heat seal bars and cutter to produce lateral end seals converting the tube into bags, forming a top seal on one bag and a bottom seal on another bag and cutting between the seals to sever one bag from the other.

4,532,755

CLIPPING COLLECTOR FOR RIDING MOWER

Michael P. Schemelin, West Bend; Tony L. Kaminski, and Paul T. Shupert, both of Milwaukee, all of Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Filed Jul. 16, 1984, Ser. No. 630,985
Int. Cl.[3] A01D *35/22*
U.S. Cl. 56—16.6 **14 Claims**



1. Grass catcher means for collecting clippings from a rotary mower that is mounted beneath a riding vehicle and has a clipping outlet opening to one side of the vehicle, comprising upwardly opening clipping receptacle means on the rear of the vehicle, extending across substantially the full width of the vehicle, and a duct communicated with said clipping outlet, said duct extending rearward and upward from said clipping outlet along said side of the vehicle and having a rearmost portion that comprises an elbow which defines a duct outlet, said grass catcher means being characterized by:

A. substantially rigid suporting structure on the vehicle for supporting said clipping receptacle means;

B. the duct outlet defined by said elbow being supported by said supporting structure at said one side of the vehicle, above the receptacle means, and opening substantially towards the other side of the vehicle; and

C. a cover hingedly connected with said supporting structure to swing between an operative position overlying said receptacle means and said elbow and and inoperative position clear of the receptacle means, said cover having deflection means thereon for controlling the trajectory of clippings issuing from said duct outlet to constrain them to move downward into the receptacle means, said deflection means comprising

(1) a top wall on the cover at a level above said duct outlet;

(2) a side wall at each side of the vehicle projecting down from said top wall to substantially the level of the top of the receptacle means;

(3) a front wall extending between said side walls, said front wall projecting down from said top wall to near the front upper edge of the receptacle means and being forwardly adjacent to said duct outlet, and

(4) an elongated baffle projecting edgewise downward from said top wall a distance to have a bottom edge spaced above the top of the receptacle means but below the top of said duct outlet, said baffle having opposite ends inwardly adjacent to said side walls,

(a) its end at said one side of the vehicle being rearwardly adjacent to said duct outlet, and

(b) its end at said other side of the vehicle being in rearwardly offset relation to its first mentioned end,

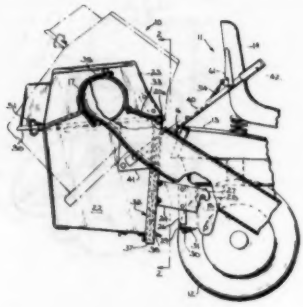
so that said baffle cooperates with the top and front walls to define a diverging channel that extends from the duct outlet towards said opposite side of the vehicle.

4,532,756

GRASS CATCHING RECEPTACLE FOR BOTH DUMPING AND BAGGING

Eugene C. Merkel, South Milwaukee, Wis., assignor to Bolens Corporation, Port Washington, Wis.

Filed Jul. 31, 1984, Ser. No. 636,339
Int. Cl.³ A01D 35/22
U.S. Cl. 56—202 4 Claims



1. A grass catching receptacle for mounting to a rear end of a ridable machine, the receptacle comprising:

a first hopper clamshell portion fixed across the rear end of the riding mower;

a second hopper clamshell portion with a top opening, with a front opening, and with an upper forward portion pivotally coupled at respective locations along an upper portion of the first hopper clamshell portion to overbalance the second hopper clamshell portion to close against the first hopper clamshell portion, the second hopper clamshell portion being pivotable away from the first hopper clamshell portion to dump material out of the front opening; and

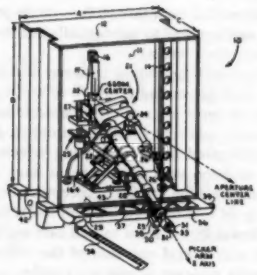
a flip-up lid disposed to cover the top opening, the lid being mounted along one of its edge portions to pivot with the pivoting of the second hopper clamshell portion, and to pivot independently of the second hopper clamshell portion when lifted for access through the top opening.

4,532,757

ROBOTIC FRUIT HARVESTER

Edward G. Tutle, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Sep. 30, 1983, Ser. No. 537,833
Int. Cl.³ A01D 45/00, 69/00
U.S. Cl. 56—328 R 39 Claims



1. A system for harvesting fruits from a tree comprising:

(a) mapping means having an aperture with positions of fruits on the tree relative to said aperture defined by horizontal and vertical coordinates thereof, said mapping means for electronically mapping said coordinates of fruits on the tree within said aperture;

(b) storage means for storing electrical signals representative of each of such mapped horizontal and vertical coordinates;

(c) extensible arm means adapted to be extended through said aperture at each of said horizontal and vertical coordinates;

(d) fruit seeking means disposed at a distal end of said extensible arm means for optically locating a fruit and for controlling the extension and position of said arm means to contact the located fruit; and

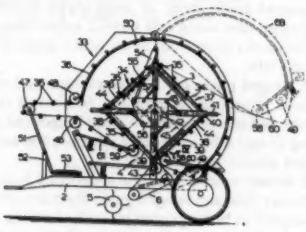
(e) fruit severence means collocated with said fruit seeking means including fruit contact sensing means, said severence means controlled by said fruit contact sensing means to grasp a sensed fruit upon contact therewith and to sever the grasped fruit from its stem.

4,532,758

DEVICE FOR FORMING A COMPRESSED PRODUCE BALE

Cornelis H. Liet, Losser, Netherlands, assignor to Multinorm B.V., Netherlands

Filed Feb. 29, 1984, Ser. No. 584,803
Claims priority, application European Pat. Off., Mar. 1, 1983, 83.810086.5
Int. Cl.³ B30B 15/32; A01F 15/00
U.S. Cl. 56—341 18 Claims



1. Device for forming a compressed produce bale, provided with a compacting cage supported on an undercarriage and having an inlet for the produce and a pick-up for picking up the produce, wherein the compacting cage has a polygonal cross section and is bounded by at least approximately planar, stiff side walls, the inlet and the compacting cage being mutually adjustable in such a manner that a uniform filling of the whole cross section of the compacting cage is achieved; the compacting cage being rotatable about its central longitudinal axis and can be driven in such a manner, that more produce is supplied per unit time to the corners of the compacting cage than to the middle section of the side walls.

4,532,759

METHOD AND APPARATUS FOR TIME-OPTIMIZING OCCURRENCE OF WORK AT INDIVIDUAL OPERATING POSITIONS OF TEXTILE MACHINES

Jürg Bischofberger, Elsau, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Mar. 28, 1983, Ser. No. 479,655
Claims priority, application Switzerland, Apr. 5, 1982, 2071/82
Int. Cl.³ D01H 9/10, 9/14, 13/24, 13/32
U.S. Cl. 57—264 19 Claims

1. A method of time optimization in the operation of a textile machine comprising a predetermined number of working positions at each one of which a yarn is wound up in a winding operation in order to produce an associated yarn package of a

predetermined set yarn length, and a working device traveling between the working positions for carrying out predetermined working operations at individual ones of said working positions, said method comprising the steps of:

determining and registering the instantaneous yarn length wound up at each yarn package while winding up thereon said yarn;

detecting at each one of said yarn packages a predetermined remainder yarn length which completes the predetermined set yarn length and said associated yarn package;

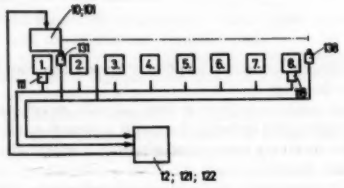
selecting a number of yarn packages at which said predetermined remainder yarn length has been detected and, while continuing the winding operation at said selected number of yarn packages, determining for each one of said selected number of yarn packages a remaining wind-up time required for winding up the remaining yarn length of the related predetermined set yarn length at the associated yarn package;

determining a momentary position of said working device, and further ascertaining:

(i) a working time required for said working device to perform said working operation at each said working positions at which an associated yarn package is produced, and

(ii) the traveling time of said working device from said momentary position thereof to each one of a selected number of working positions with each one of which a related one of said selected number of yarn packages is associated; and

comparing said traveling times plus said working times



required by said working device for performing said working operations at said selected number of working positions with said remaining wind-up times determined for each one of said selected number of associated yarn packages and, as a result of such comparison, controllably guiding said working device from said momentary position thereof to said selected number of working positions in a working sequence which results in a minimum total loss of yarn length or yarn quality, while said working operations are carried out at all of the selected number of working positions.

16. An apparatus for time-optimization in the operation of a textile machine comprising:

a predetermined number of yarn packages arranged at a predetermined number of working positions at each one of which a yarn is wound-up in a winding operation in order to produce an associated yarn package of a predetermined set yarn length;

a working device travelling between said predetermined number of working positions for carrying out predetermined working operations at individual ones of said predetermined number of working positions;

length measuring means determining the instantaneous length of the already wound-up yarn on each one of said predetermined number of yarn packages;

a computer operatively associated with said length measuring means;

said length measuring means generating signals corresponding to said instantaneous length of the already wound-up yarn on each one of said predetermined number of yarn packages and delivering said signals to said computer;

indicating means emitting a signal indicating the momentary position of said working device and operatively associated with said computer;

said computer registering the signals indicating said instantaneous yarn length and determining, at each one of said predetermined number of yarn packages, a predetermined remainder yarn length which completes the predetermined set yarn length;

said computer determining, for a pre-selected number of said predetermined number of yarn packages at which said predetermined remainder yarn length has been determined and on the basis of said momentary position of said working device indicated by said signal emitted by said indicating means,

(i) a working time required for said working device to perform said predetermined working operation at each one of said pre-selected number of yarn packages,

(ii) a travelling time of said working device from said momentary position thereof to each one of a pre-selected number of working positions which correspond to the working positions of said pre-selected number of yarn packages,

(iii) a remaining wind-up time required for winding-up the remaining yarn length of the predetermined set yarn length at each one of said pre-selected number of yarn packages; and

said computer containing comparison means comparing said travelling times plus said working times of said working device at said pre-selected number of working positions, with said remaining wind-up times at each one of said pre-selected number of yarn packages and, as a result of such comparison, controllably guiding said working device from said momentary position thereof to said pre-selected number of working positions in a working sequence which results in a minimum total loss of yarn length or yarn quality, while said working operations are carried out at all of the pre-selected number of yarn packages.

4,532,760

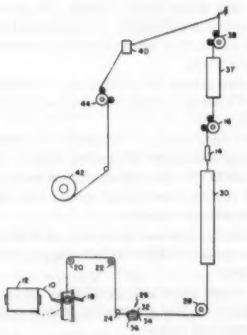
D. C. YARN TENSION CONTROL

Harold L. Johnson, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 21, 1984, Ser. No. 582,044

Int. Cl.³ D02G *3/34;* D01H *13/10;* B65H *59/22*

U.S. Cl. 57—283 **6 Claims**



1. Apparatus to produce a yarn having areas of differential bulk throughout its length comprising: a texturing device, supply means supplying continuous filament, synthetic yarn to said texturing device, a heater means located between said texturing device and said supply means to heat the yarn passing to said texturing device, means taking up yarn from said texturing device and a disc tension device mounted between said

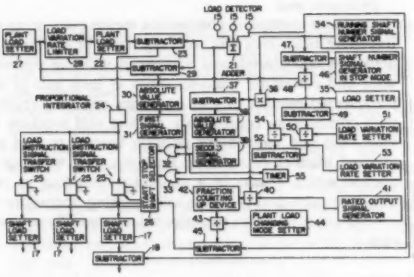
supply means and said heater means to vary the supply of yarn to said heater means, said disc tension including an electromagnet, a post member operably associated with said electromagnet, a first metallic disc member mounted on said post, a second metallic disc member mounted on said post adjacent said first disc member, means supplying direct current voltage to said electromagnet, said means to supply direct current voltage including a first means to randomly and intermittently increase the direct current voltage to said electromagnet and a second means to drive the increased direct current voltage to substantially zero to cause said first and said second disc members to move suddenly relative to one another.

4,532,761

LOAD CONTROL SYSTEM AND METHOD OF COMBINED CYCLE TURBINE PLANTS

Hiroshi Takaoka, Urayasu; Toshiki Furukawa, and Hiroshi Fukuda, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaka, Japan

Filed Sep. 9, 1983, Ser. No. 530,785
Claims priority, application Japan, Sep. 10, 1982, 57-157594
Int. Cl.³ F02C *6/02, 6/18*
U.S. Cl. 60—39.13 **6 Claims**



1. A load control system of a combined cycle turbine plant including a plurality of single shaft type combined cycle systems, said load control system comprising:

a plant load setter for producing an output setting a desired plant load;

a load detector for indicating actual plant output;

a first signal generator for comparing said desired plant load set to said actual plant output and generating an output signal when a difference between said desired plant load set and said actual plant output becomes less than a predetermined value;

a shaft value means for producing an output indicating a set value of load of at least one shaft whose load variation rate changes;

a shaft running number indicator for providing an output indicating a number of running shafts;

a multiplier for producing an output indicative of a product of said shaft value means output and said shaft running number indicator output;

a subtractor for producing an output indicating a difference between said multiplier means output and said load detector output;

a second signal generator producing an output signal when said output of said subtractor means becomes less than a predetermined value;

means for calculating a number of shafts to be stopped in accordance with a decrease in the load set;

means for detecting an interval in which shafts which continue running are to be maintained at a predetermined load; and

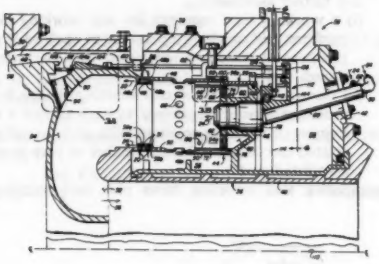
shaft control means responsive to said first signal generator or said second signal generator and said calculating means for increasing or decreasing the number of running shafts to make the number of stopped shafts equal to that determined by said calculating means, said shaft control means including means for increasing the loads of the shafts which continue running in accordance with either one of a signal generated by said first signal generator or a signal generated by said running interval detecting means.

4,532,762

GAS TURBINE ENGINE VARIABLE GEOMETRY COMBUSTOR APPARATUS

Hukam C. Mongia; Edwin B. Coleman, both of Tempe, and Thomas W. Bruce, Pheonix, all of Ariz., assignors to The Garrett Corporation, Phoenix, Ariz.

Filed Jul. 22, 1982, Ser. No. 400,580
Int. Cl.³ F02C *7/00*
U.S. Cl. 60—39.23 **14 Claims**



1. Variable geometry combustor apparatus comprising:

(a) a housing;

(b) a combustion liner at least partially enveloped by said housing and defining therewith a plenum in said housing for receiving pressurized air from a source thereof, said liner having:

(1) an upstream end wall positioned within said housing plenum,

(2) an interior wall positioned downstream from said end wall,

(3) a sidewall portion extending downstream from said end wall within said housing, said sidewall portion defining with said interior wall and said end wall an inlet plenum within said liner, and further defining a combustion flow passage extending downstream from said interior wall,

(4) inlet opening means for admitting pressurized air from said housing plenum into said liner plenum,

(5) swirler means for flowing pressurized air entering said liner plenum into said combustion flow passage in a swirling flow pattern,

(6) cooling passage means, communicating with said liner plenum and extending within said flow passage along a dome portion thereof positioned at the upstream end of said flow passage, for flowing pressurized air from said liner plenum along said sidewall portion to cool the same, and

(7) primary air inlet opening means, positioned downstream from said dome portion, for flowing pressurized air from said housing plenum into said combustion flow passage;

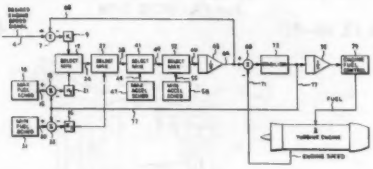
(c) nozzle means for injecting fuel into said dome portion for mixture and combustion with air entering said flow passage; and

(d) means for selectively varying air inflow through said liner plenum inlet opening means to thereby simultaneously regulate air flow through said swirler means and said cooling passage means.

4,532,763
ISOCHRONOUS GAS TURBINE SPEED CONTROL

Alan D. Pisano, Chelsea, Mass., assignor to General Electric Company, Cincinnati, Ohio

Filed Jan. 28, 1983, Ser. No. 461,774
Int. Cl.³ F02C 9/28
U.S. Cl. 60—39.281 3 Claims



1. Apparatus for controlling a fuel delivery signal in a gas turbine engine, comprising:

(a) means for receiving an input signal indicative of a desired rate of fuel delivery to the engine;

(b) fuel delivery rate bounding means for bounding the influence of the input signal between limits indicative of maximal and minimal fuel delivery rates;

(c) acceleration bounding means for bounding the influence of the input signal between limits indicative of maximal and minimal engine accelerations;

(d) first integration means for integrating the signal as bounded in (b) and (c) to produce a preliminary output signal;

(e) feedback means for modifying the input signal in accordance with the preliminary output signal;

(f) means for modifying the preliminary output signal in accordance with the rotational speed of a predetermined component of the engine;

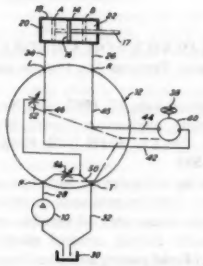
(g) second integration means for integrating a signal derived from the preliminary output signal and for producing a signal for controlling fuel delivery; and

(h) means for modifying the limits imposed by the fuel rate bounding means of (b) as a function of a signal derived from the preliminary output signal, wherein the limits are modified as a function of the first time deriative of fuel flow by virtue of the second integration means.

4,532,764
REACTION TYPE HYDRAULIC STEERING CONTROL UNIT

Poul H. H. Pedersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Jan. 7, 1983, Ser. No. 456,426
Int. Cl.³ F15B 15/18
U.S. Cl. 60—384 2 Claims

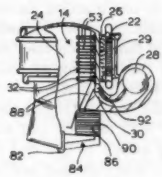


1. A hydraulic steering control system comprising, a bidirectional differential type servomotor having rod side and non-rod side operating ports on opposite sides thereof, pump and tank means, manually operable steering control means, a reaction type metering control unit having a housing, metering motor means in said housing, first and second relatively rotatable control valve means connected respectively to said steering control means and said metering motor means, spring means between said first and second control valve means, said housing having a supply port connected to said pump means and an exhaust port connected to said tank means, said housing having first and second control ports connected respectively to said rod and non-rod side servomotor operating ports, flow path means determined by said steering control means and controlled by said valve means for directing supply fluid from said supply port through said metering motor means to either of said control port connections and directing exhaust fluid from the other of said control port connections to said tank means, said flow path means including exhaust valve throttle means in passage means between said non-rod side servomotor port and said tank means controlled by said control valve means to be (1) open when said control valve means is in a neutral position to exhaust fluid from said non-rod side thereof to said tank means during centering of said servomotor towards said non-rod side and (2closed while supply fluid is being directed to either side of said servomotor.

4,532,765
STIRLING ENGINE WITH AIR WORKING FLUID

John A. Corey, North Troy, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Apr. 30, 1984, Ser. No. 605,476
Int. Cl.³ F02G 1/04
U.S. Cl. 60—517 8 Claims



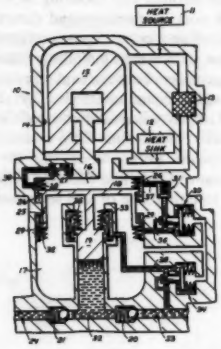
1. A Stirling engine which includes a compression means and expansion means; a combustion chamber for generating heat; a cylindrical shaped heat exchange module positioned about the combustion chamber to accept the transfer of heat therefrom, said heat exchange module includes a plurality of heater tube units positioned circumferentially about said combustion chamber and through which working gas passes and is heated, regenerator means in the form of a fiber matrix, cooling means for cooling the working fluid, said heating tube units, regenerator means and cooling means, each being cylindrical in shape and positioned respectively in a layered fashion each about the next; cold connecting duct means coupling the cooling means with the compression means so as to enable the passing of the working fluid therebetween; hot connecting duct means coupling the heating means with the expansion means so as to enable the passing of working gas therebetween; and said compression and expansion means operate to provide a periodic flow of working gas through the heat exchange module in a Stirling cycle of operation.

4,532,766

STIRLING ENGINE OR HEAT PUMP HAVING AN IMPROVED SEAL

Maurice A. White, 2802 S. Everett Pl., Kennewick, Wash. 99337; Peter Riggle, 616 Fuller, and Stuart G. Emigh, 67 Park St., both of Richland, Wash. 99352

Filed Jul. 29, 1983, Ser. No. 518,527
Int. Cl.[3] F02G 1/04
U.S. Cl. 60—517 8 Claims



1. A Stirling cycle engine or heat pump having a volume of working gas exhibiting cyclical variations in instantaneous pressure, comprising:

a first machine element centered along an axis;

a second machine element coaxially arranged along said axis;

clearance seal means between complementary cylindrical surfaces of the first and second machine elements presenting a slidable interface for accommodating reciprocating movement of one machine element relative to the other along said axis for power transmission purposes;

a first gas-filled fluid region maintained at the instantaneous pressure of the working gas and partially bounded by portions of both the first and second machine elements;

a second liquid-filled fluid region partially bounded by other portions of both the first and second machine elements and leading axially to one end of the slidable interface presented by said clearance seal means;

means in the form of a cylindrical bellows arranged coaxially along said axis and sealed at its opposite axial ends to both the first and second machine elements, said bellows having opposite sides contacted by gas and liquid in communication with the first and second fluid regions, respectively, for hermetically separating the first and second fluid regions while permitting relative reciprocating movement between the first and second machine elements;

the nominal effective diameter of the cylindrical bellows being substantially equal to the effective diameter of the slidable cylindrical interface formed between the first and second machine elements by the clearance seal means;

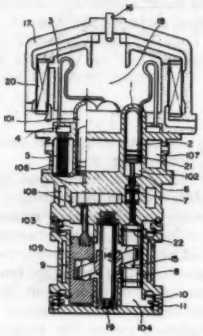
and hermetically sealed compensator means including a diaphragm or bellows having opposite surfaces in open communication with said first and second fluid regions, respectively, for causing instantaneous pressure changes in the liquid-filled fluid region in response to cyclical variations in the instantaneous pressure of the gas-filled fluid region.

4,532,767

ENGINE COMPRESSOR HAVING A STIRLING CYCLE ENGINE

Tetsumi Watanabe, Okazaki; Shigenori Haramura, Toyoake, and Yutaka Momose, Anjyo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 376,218, May 7, 1982, abandoned. This application Dec. 11, 1984, Ser. No. 680,589
Claims priority, application Japan, May 9, 1981, 56-70020
Int. Cl.[3] F02G 1/04
U.S. Cl. 60—525 4 Claims



1. An engine-compressor comprising a stirling engine which includes a plurality of working cylinders arranged on a circle with the same phase angle difference, a plurality of working pistons respectively disposed in said working cylinders for axial reciprocating movements to thereby divide each of the cylinders into an expansion space and a compression space, the expansion space in one of the cylinders being connected through heating means and heat accumulating means with the compression space in another cylinder, a plurality of guide cylinders, a plurality of guide pistons disposed respectively in said guide cylinders for axial reciprocating movements due to the axial movement of the working pistons, said guide pistons being connected through piston rods with respective ones of the working pistons and defining in the respective guide cylinders compression chambers located at the opposite sides of the respective guide pistons, intake valve means provided in said compression chamber for admitting air or coolant thereto to be compressed by said guide piston, and outlet valve means provided in said compression chamber for removing compressed air or coolant from the compression chamber, and a swash plate operably connected to said guide pistons to be driven thereby, independently of the compressed air from said compression chambers, for converting the axial reciprocating movement of said guide pistons into rotating movement.

4,532,768

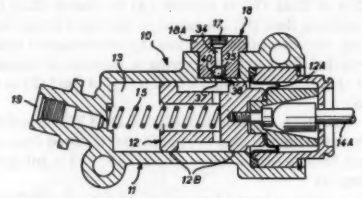
VALVE DEVICE FOR A HYDRAULIC CIRCUIT

Hervé Focqueur, Franconville, France, assignor to Valeo, Paris, France

Filed Feb. 22, 1983, Ser. No. 468,635
Claims priority, application France, Mar. 3, 1982, 82 03485
Int. Cl.[3] F15B 7/08; F16K 25/02
U.S. Cl. 60—585 8 Claims

1. A hydraulic valve device for a hydraulic circuit, comprising a cylinder, a piston mounted to slide in said cylinder and defining therein a chamber of variable volume for connection to the hydraulic circuit, control means for controlling the displacement of said piston, and a tank connected to said chamber by a passage having a non-return valve, wherein said passage is separate from the hydraulic circuit and incorporates a cylindrical cavity which has at its end adjacent said tank an orifice coaxial with said cavity and surrounded by a leak-proof

seat, said nonreturn valve incorporating a ball which is engaged with a slight play in said cylindrical cavity and operable to abut said leakproof seat when the pressure in the chamber is greater than that in the tank, and wherein said cavity incorporates, at its end adjacent said chamber, an orifice which is coaxial with the cavity and which is surrounded by a permeable seat for said ball, this permeable seat having a very substantially reduced communication cross-section when said ball is in engagement therewith, said reduced communication cross-section being operative to limit the flow of hydraulic fluid from the tank to the chamber in case of a negative pressure produced in the chamber by a sudden release of said control means, and restoring means for biasing said ball to said permeable seat.

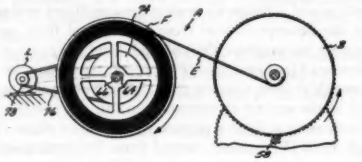


4,532,769

ENERGY STORING FLYWHEEL ASSEMBLY

Lyle A. Vestermark, 714 Pacific Ave., #1108, Long Beach, Calif. 90813

Filed Sep. 4, 1984, Ser. No. 646,962
Int. Cl.³ B60K 9/04
U.S. Cl. 60—698 **7 Claims**



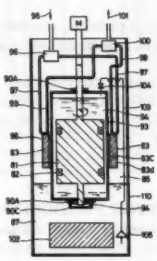
1. An energy producing fly wheel assembly that includes:
a. first and second laterally spaced, transversely aligned, rotatably supported first and second reels that have first and second hubs, said second hub of substantially greater diameter than said first hub;
b. an elongate coilable ribbon that extends between said first and second hubs and is secured thereto with said ribbon initially having the major portion thereof coiled on said second hub;
c. a first rotatably supported shaft;
d. a first fly wheel rotatably supported on said first shaft;
e. first means for rotating said first fly wheel with said first shaft only when said first shaft rotates in a first direction;
f. a first clutch that includes a power input and power output shaft and first movable clutch control means that can occupy either first or second positions, said first clutch transmitting rotational power from said power input to said power output shaft only when said clutch control means is in said second position;
g. second means for transferring rotational power from said first fly wheel to said power input shaft;
h. third means for transferring rotary motion of said second reel to said first shaft;
i. fourth means for intermittently rotating said first reel to wind said ribbon thereon when said first clutch is in said first position to accelerate the rotation of said second reel, and said first shaft and first fly wheel in said first direction until substantially all of said ribbon has been removed from said first hub and said first fly wheel is rotating at a predetermined maximum velocity, with said first clutch control means thereafter being moved to said second position for rotational power from said first fly wheel to be transferred to said power output shaft; and
j. fifth means for intermittently rotating said second reel in a direction to rewind said second ribbon on said second hub as said first fly wheel rotates for subsequent use in accelerating said first fly wheel to said predetermined maximum velocity.

4,532,770

MAGNETIC REFRIGERATOR

Yoshinori Hakuraku; Hisanao Ogata; Takahiro Daikoku, all of Ibaraki, and Noboru Suzuki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1984, Ser. No. 625,241
Claims priority, application Japan, Jun. 29, 1983, 58-115818
Int. Cl.³ F25B 21/02
U.S. Cl. 62—3 **4 Claims**



1. In a magnetic refrigerator which is provided with a plurality of magnetic refrigeration working substances which generate heat when magnetized and absorb heat when demagnetized, a magnetic field generating device which magnetizes and demagnetizes said working substances periodically, a heat-releasing mechanism which releases heat to a high-temperature side when said working substances are magnetized, and a heat-absorbing mechanism which absorbs heat from a low-temperature side when said working substances are demagnetized, and in which said working substances operate in a stationary state, a magnetic refrigerator characterized by the provision of a rotor with a plurality of coils arranged around the circumference thereof and a means for driving said rotor, wherein a plurality of said working substances are arranged around the outer or inner periphery of said rotor, a current flows through said coils so as to form a distribution of magnetic fields around the periphery of said rotor such that the strength of said magnetic fields is increased and decreased, and said rotor is rotated to magnetize and demagnetize said working substances periodically.

4,532,771

COOLER MADE OF ALUMINUM FOR STIRLING ENGINES

Yutaka Momose, Anjyo; Kazuaki Yamaguchi, Kariya; Masayoshi Okamoto, Oyama; Ryoichi Hoshino, Oyama, and Hiroki Tanaka, Oyama, all of Japan, assignors to Showa Aluminum Corporation, Osaka and Aisin Seiki Co., Ltd., Aichi, both of, Japan

Filed Jul. 28, 1983, Ser. No. 518,031
Claims priority, application Japan, Jul. 30, 1982, 57-133902
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **4 Claims**

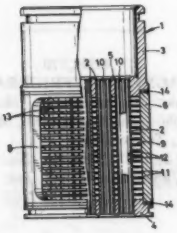
1. A heat exchange apparatus made substantially of alumi-

num to cool a working medium under high pressure, comprising:

(a) a multiplicity of cooling tubes for conducting a working medium,

(b) a pair of headers joined to opposite ends of said cooling tubes respectively,

(c) inner fins disposed longitudinally along the inner walls of said tubes,



(d) a multiplicity of plate fins intersecting and attached to the cooling tubes at spaced distances along the outer walls of said tubes,

(e) a shell surrounding the tubes and plate fins, joined to the headers to provide a closed cooling area, and

(f) an inlet and an outlet through said shell for passage of cooling water.

4,532,772

METHOD FOR PRODUCING MODEL ICE

Seppo Mäkinen, Espoo, Finland, assignor to Oy Wärtsilä Ab, Helsinki, Finland

Filed Dec. 8, 1983, Ser. No. 559,391

Claims priority, application Finland, Dec. 17, 1982, 824363

Int. Cl.³ F25C *1/00*

U.S. Cl. 62—74 **16 Claims**

1. A method of producing on a body of water a layer of ice suitable for ship model ice tests, comprising forming a layer of ice having physical properties for ship model ice tests by:

(a) creating a low-temperature atmosphere over the surface of the body of water;

(b) spraying water into the atmosphere over the water surface, in such a way that water droplets formed by the spraying freeze in the low-temperature atmosphere;

(c) directing the freezing spray onto the water surface, so that the frozen water droplets settle onto the water surface and form ice thereon; and

(d) continuing the spraying until substantially the entire desired thickness of the ice layer has been built up.

4,532,773

PROCESS FOR PRODUCING COLD AND/OR HEAT BY MEANS OF AN ABSORPTION CYCLE COMPRISING AT LEAST TWO ABSORPTION STEPS

Alexandre Rojey, Garches; Régis Bonifay, Asnieres, and Jean-Paul Cariou, Orgeval, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 10, 1984, Ser. No. 569,697

Claims priority, application France, Jan. 10, 1983, 83 00370

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—101 **8 Claims**

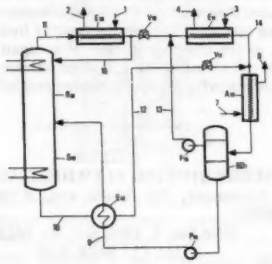
1. A process for producing cold and/or heat, comprising the following steps:

(a) contacting, in a first absorption step, a vapor phase (V_1) comprising a working fluid (F) and an auxiliary fluid (H) with a solution (S) of fluid (F) in a solvent (S) discharged from step (c), under operating conditions providing for absorption of fluid (F) and at most partial condensation of fluid (H), transferring heat to an external fluid so as to obtain a solution (S_2) of (F) in (S) of increased fluid (F) content and a vapor phase (V_2) comprising unabsorbed fluid (F) and uncondensed fluid (H), and separating said solution (S_2) from said vapor phase (V_2), said fluid (H) being at least partly immiscible with solvent (S) and with the solutions of fluid (F) in solvent (S);

(b) contacting, in a second absorption step, the vapor phase (V_2) issued from step (a) with a relatively lean solution (S_3) of fluid (F) in solvent (S) to absorb fluid (F) and condense fluid (H) contained in the vapor phase, transmitting the absorption heat and the condensation heat to an external fluid and recovering a mixture of liquid phase (L_1) of fluid (H) with a solution (S_1) of fluid (F) in solvent (S);

(c) separating the solution (S_1) of fluid (F) in solvent (S) from the liquid phase (L_1) of fluid (H) issued from step (b) and feeding said solution (S_1) of fluid (F) in solvent (S) to step (a);

(d) supplying at least a fraction of solution (S_2) of fluid (F) in solvent (S) issued from step (a) to a desorption step, subjecting said solution to desorption conditions and supplying the desorption heat from an external fluid, so as to obtain a vapor phase (V_3) of high fluid (F) content and a solution (S_3) of low fluid (F) content, separating the vapor phase (V_3) from solution (S_3) abd recycling said solution (S_3) to the second absorption step (b);



(e) condensing at least a portion of the vapor phase (V_3) of high fluid (F) content, issued from desorption step (d), while supplying heat to an external fluid to form a condensation liquid phase (L_2);

(f) admixing at least a portion of the condensation liquid phase (L_2) obtained in step (e) with at least a portion of the liquid phase (L_1) of liquid (H) issued from step (c) and vaporizing at least a portion of the resultant mixture by taking heat from an external fluid, the operating conditions being so selected as to provide for the vaporization of at least a portion of fluid (F) and at least a portion of fluid (H), thus obtaining a vapor phase (V_1), and

(g) recycling the resultant vapor phase (V_1) to step (a).

4,532,774

PORTABLE FIELD SITE PRE-COOLING APPARATUS

Daniel E. Burns, Camarillo, Calif., assignor to Demco, Inc., Oxnard, Calif.

Filed Nov. 21, 1983, Ser. No. 553,579

Int. Cl.³ B60H *3/04*

U.S. Cl. 62—239 **4 Claims**

1. A portable apparatus for pre-cooling produce at the field site where the produce is harvested, including, in combination:

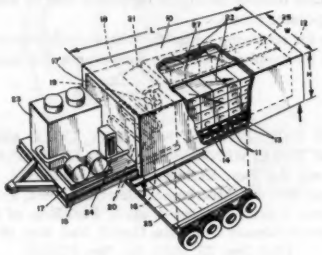
(a) an elongated refrigerated enclosure of given length, width and height having gravity conveyors on its floor;

(b) a rear end door substantially co-extensive with the width and height of said enclosure for enabling the loading of pallets supporting containers of freshly harvested produced onto said gravity conveyors;

(c) a movable platform extending partially into the front of said enclosure to define an inside platform area in said

enclosure and an outside platform area outside the enclosure;

(d) an air handling housing supported on said inside platform area in the front end of said enclosure including an exhaust fan, cooling coils and upper ducting for passing refrigerated air over the tops and around the outer sides and through said containers of produce to remove field heat



from the produce, the resulting heated air being drawn into said air handling housing by said exhaust fan;

(e) refrigeration equipment supported on the outside platform area outside said enclosure connected through the front of said enclosure to said cooling coils; and,

(f) a detachable dolly supporting said enclosure so that it can be transported in the manner of a trailer to a new field site if desired.

4,532,775

AIR COOLER WITH CONDENSATE TRAP

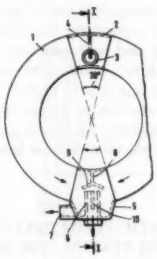
Rudolf Hofmann, c/o ISARTALER Schraubenkompressoren GmbH, Wallensteinstrasse 20, 8192 Geretsried 2, Fed. Rep. of Germany

Continuation of Ser. No. 230,516, Feb. 2, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,573

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 8003708[U]

Int. Cl.³ F25D *21/00*

U.S. Cl. 62—272 **5 Claims**



1. A gas cooler and condensate trap comprising:

a housing defining a gas flow passage with an inlet at the top and an outlet at the bottom, gas entering the inlet being cooled as it flows through the housing to the outlet;

a wall extending upwardly around the periphery of said outlet, the cooled gas impinging on the outside of said wall enhancing the separation of condensate from the cooled gas, said wall preventing the separated condensate from reaching the outlet, said housing and wall forming a trap for said separated condensate;

a trap rib disposed above and described toward said outlet wall, said trap rib having cross pieces extending outwardly therefrom, the cross pieces being spaced from and projecting over said outlet wall to guide said gas and remove condensate therefrom; and

a condensate discharge from said trap.

4,532,776

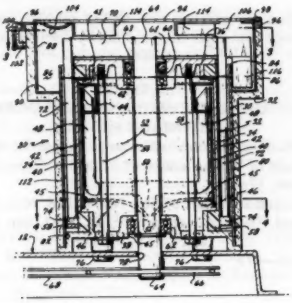
HIGH EFFICIENCY ICE MAKING MACHINE AND FAIL SAFE MECHANISM THEREFOR

Henio R. Arcangeli, 2406 30th St., Santa Monica, Calif. 90405

Filed Oct. 29, 1982, Ser. No. 437,531

Int. Cl.³ F25C *1/14*

U.S. Cl. 62—354 **16 Claims**



1. An ice making machine comprising:

a water tank including a refrigerated wall and a water tank wall terminating in a circular upper rim;

auger means rotatable relative to said refrigerated wall for breaking off flakes of ice from a layer of ice forming on said refrigerated wall;

means cooperating with said rotatable auger for raising flake ice out of said water tank;

overlying said upper rim so as to allow the flake ice to rise above said rim and form a structure of flake ice rotating in said headspace with said auger;

ice collecting means disposed exteriorly of said water tank and below said rim;

stationary deflector means disposed generally tangentially across the path of said moving flake ice structure for breaking up the circularly moving structure breaks up on contact with the deflector means into relatively small ice flake clusters which are deflected over said rim and into said collecting means; and

sweeper means rotatable with said auger means for sweeping flake ice out of said ice collecting means through a discharge opening formed in the ice collecting means.

4,532,777

TWO STAGE COOLING SYSTEM

Tommy L. Thompson, Tucson, Ariz., assignor to University of Arizona Foundation, Tucson, Ariz.

Filed May 23, 1983, Ser. No. 497,267

Int. Cl.³ F25D *17/02*

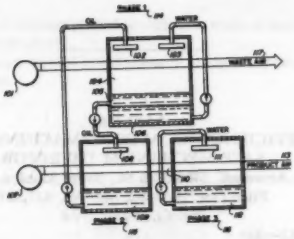
U.S. Cl. 62—434 **18 Claims**

1. A gas cooling system comprising:

A. means

1. for cooling a first liquid, and

2. for placing said first liquid in direct contact with a oil-like liquid, thereby cooling said oil-like liquid; and



B. means for placing the cooled oil-like liquid in direct contact with a gas stream, thereby cooling said gas stream.

4,532,778

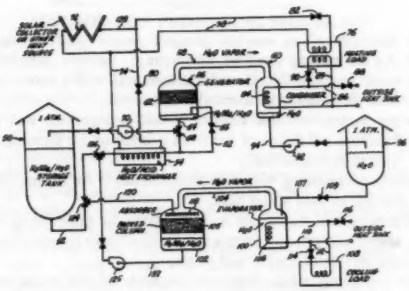
CHEMICAL HEAT PUMP AND CHEMICAL ENERGY STORAGE SYSTEM

Edward C. Clark, Woodinville, and Douglas D. Huxtable, Bothell, both of Wash., assignors to Rocket Research Company, Redmond, Wash.

Continuation-in-part of Ser. No. 91,828, Nov. 16, 1979, abandoned. This application Mar. 24, 1981, Ser. No. 247,004

Int. Cl.³ F25B *17/00*

U.S. Cl. 62—477 **21 Claims**



1. An energy storage and heat pump system comprising:

acid storage means for storing an aqueous sulfuric acid solution at atmospheric pressure,

generator means for removing water vapor from an aqueous sulfuric acid solution, condenser means for condensing water vapor, and conduit means for placing said generator means in vapor communication with said condenser means,

absorber means for absorbing water vapor into a sulfuric acid solution, evaporator means for producing water vapor from water, and conduit means placing said evaporator means and said absorber means in vapor communication, said generator means, condenser means, absorber means and evaporator means being maintained at a pressure other than atmospheric,

means for transferring sulfuric acid solution from said generator means to said acid storage means,

means for supplying sulfuric acid solution to and removing sulfuric acid solution from said absorber means, said sulfuric acid solution being supplied to said absorber means from said acid storage means, said acid being stored in concentrated form in said storage means, the heat of dilution and the heat of condensation being released upon the absorption of water onto said acid solution in said absorber, said acid solution when concentrated in said generator means and stored in said storage means thereby storing energy until released in said absorber means,

first heat transfer means for supplying heat to the sulfuric acid solution for evaporation of water vapor therefrom in said generator means,

second heat transfer means for removing heat from water vapor present in said condenser means,

third heat transfer means for supplying heat to water in said evaporator means,

means for removing water from said condenser means, and means for supplying water to said evaporator means.

4,532,779

DEVICE FOR GENERATING A DRY, COLD AIR FLOW FOR TREATMENT OF RHEUMATIC DISEASES

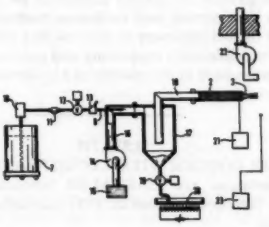
Thomas von der Bey, Ratingen; Detlef Jankowski, Duisburg; Hartmut Schmidt, Meerbusch; Klemens Thoma, Krefeld, and Wolfgang Volker, Tönisvorst, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,838

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1983, 3305434

Int. Cl.³ F25B *19/00*

U.S. Cl. 62—514 R **2 Claims**



1. In a device for generating a dry, cold air flow for treatment of rheumatic diseases, the device having a connection connected to a supply of a cryogenic liquefied gas, a blower in flow communication with the device and the gas supply for generating the air flow, and a unit communicating with the device for heat exchange between liquefied gas and air flow, with possibility of separating the frozen-out moisture, the improvement being said heat exchange unit being a cyclone separator, said cyclone separator having an intake line connected to the outlet line of said blower by means of a further line in which said connection for the liquefied gas feed ends, and said cyclone separator having an outlet opening at which an insulated, hand held flexible hose is attached.

4,532,780

PNEUMATIC FIBER RECOVERY AND REDISTRIBUTION SYSTEM FOR SLIVER HIGH PILE FABRIC KNITTING MACHINES

Alan L. Tilson; Earl R. Quay, both of Orangeburg, and John C. Knight, North, all of S.C., assignors to Mayer, Wildman Industries, Inc., Orangeburg, S.C.

Continuation-in-part of Ser. No. 539,801, Oct. 7, 1983, abandoned. This application Sep. 5, 1984, Ser. No. 647,632

Int. Cl.³ D04B *9/14;* **D01G** *15/40*

U.S. Cl. 66—9 B **22 Claims**

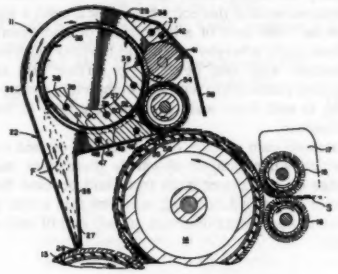
1. A fiber recovery and redistribution device for a fiber transfer and feeding unit for a sliver high pile fabric knitting machine, said unit including a doffer, a main cylinder and a pair of sliver feeding elements, said device being characterized by

(a) a suction chamber,

(b) suction means for removing fibers pneumatically from the doffer into the suction chamber,

(c) filter means for separating the air and removed fibers internally of the suction chamber,

(d) fiber discharge means for discharging the fibers from the suction chamber and



(e) fiber return feed means disposed externally of the suction chamber for delivering the discharged fibers to the main cylinder,

(f) said fiber return feed means including means for forming the discharged fibers into a uniform layer of aligned fibers for uniform redistribution upon the main cylinder.

4,532,781

KNITTING MACHINE

Alfred Buck, Bondorf, Fed. Rep. of Germany, assignor to Memminger GmbH, Freudenstadt, Fed. Rep. of Germany

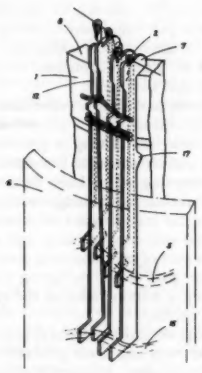
PCT No. PCT/DE82/00039, § 371 Date Oct. 21, 1982, § 102(e) Date Oct. 21, 1982, PCT Pub. No. WO82/03096, PCT Pub. Date Sep. 16, 1982

PCT Filed Mar. 2, 1982, Ser. No. 438,890

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3108041

Int. Cl.³ D04B *15/06, 15/14*

U.S. Cl. 66—104 **19 Claims**



1. A knitting machine having

at least one needle carrier (1) formed with a bearing surface portion,

needles (2) with elongated shafts located on the carrier guided parallel to one another for longitudinally displaceable movement,

a needle cam curve (5) controlling longitudinal displacement of the needles;

sinkers (7) each having a throat, a looping edge, and an elongated, flat shaft (12) located on the carrier (1);

a sinker cam curve (15) controlling longitudinal displacement of the sinkers (7),

said sinkers protruding between the needles and beyond the needle carrier;

means (18) for supporting each sinker on the carrier for movement of said throat, looping edge, and shaft both transversely relative to the needles and in the longitudinal direction,

said sinker cam curve (15) controlling the sinkers such that at a given knitting location, after the closing of a knitting loop, they are moved contrary to the drawing-off movement of the associated needles and transversely thereto toward the outside away from the shank of the needle and, after the casting off of the loop, they are moved inward toward the shank of the needle and further contrary to the needle projection movement and transversely thereto, characterized in that

the sinker shafts (12) are supported and guided on the bearing surface portion of the needle carrier (1) and form lateral guide ribs for the needle shafts (3) of adjacent needles (2) ,

said sinker shafts (12) are of a length at least similar to the length of the needles to provide lateral support for the needles essentially throughout their lengths;

and wherein the needle cam curve (5) is located intermediate the length of the sinker shafts (12).

4,532,782

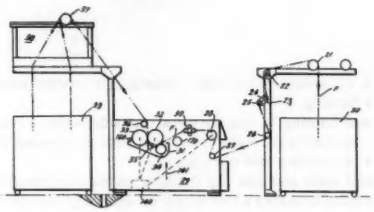
APPARATUS FOR PAD BATCH DYEING OF TUBULAR KNITTED COTTON FABRICS

John R. Sellers, Davidson, N.C., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Filed Apr. 4, 1984, Ser. No. 596,615

Int. Cl.³ D06B *3/18*

U.S. Cl. 68—13 R **21 Claims**



1. Apparatus for pad batch dyeing of tubular knitted fabric, which comprises

(a) means for supplying the tubular knitted fabric in generally flat form and under a relatively minimum lengthwise tension,

(b) a driven entry roller,

(c) means to guide the supplied tubular knitted fabric around a portion of the entry roller whereby the fabric is advanced under the control of the entry roller,

(d) width-adjustable ring guide means positioned immediately downstream of and in close coupled relation to said entry roller,

(e) said ring guide means engaging the tubular knitted fabric internally by its opposite edges and guiding said edges,

(f) said ring guide means being laterally adjustable to enable said tubular knitted fabric to be maintained at a relatively uniform width not significantly greater than its natural width,

(g) a dyeing-extracting means arranged downstream of and in close coupled relation to said ring guide means,

(h) said dyeing-extracting means comprising a pair of front and back resilient squeeze rollers mounted on parallel, horizontally spaced axes,

(i) a solution pan mounted below said squeeze rollers and

adapted to contain a treating solution at a level below the axes of said squeeze rollers and above the lower extremities of said rollers,

(j) a resilient dye roller mounted in said solution pan in submerged relation to the solution contained therein and in resilient contact with said front squeeze roller to form a dye nip,

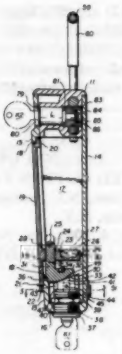
(k) a guide roller mounted in said solution pan in submerged relation to said said solution for redirecting said fabric to exit from said solution upwardly to the squeeze nip formed by the line of contact between said squeeze rollers.

4,532,783

DOUBLE LOCK LOCK BOX

Thomas A. Maurice, 9111 Orangevale Ave., Orangevale, Calif. 95662

Filed Dec. 27, 1982, Ser. No. 433,981
Int. Cl.³ E05B *65/48*
U.S. Cl. 70—63 **16 Claims**



1. An article or key safe comprising in combination:

a housing,

said housing having an open top, side walls, a rear wall, a bottom wall, and a front wall with an opening therein,

a cap closing said open top,

said walls and said cap defining an interior chamber,

a shackle having a pair of spaced-apart legs slidably disposed through yet retained by said cap,

first locking means operatively associated with latch means carried within said cap to engage said shackle, whereby said shackle can move from a first locked position which secures said key safe to a door handle or the like, to a second open position allowing removal of said key safe,

a removable cover closing said opening in said front wall, whereby removing said cover allows access to said interior chamber and its contents,

second locking means operatively associated with said cover which in a first operative position secures said cover in a locked relationship with said front wall completely covering said opening, and in a second inoperative position allows the removal of said cover from said opening revealing said interior chamber wherein said cover has a rabbetted upper edge which engages a complimentary configured edge on an upper lip of said opening in said front wall such that the outer surface of said cover is flush with the outer surface of said front wall when said cover is in a locked position,

a transversely disposed web member extending inwardly from a bottom portion of said cover, an end of said web member being in close proximity to said rear wall and spring biased outwardly therefrom,

said web member having an upwardly disposed trough therein with a spring clip to retain small objects such as keys within said trough,

a vertical passage through said web member between said trough and a back surface of said cover,

said passage slidably retains a downwardly biased, substantially L-shaped cover latch with a beveled edge on a bottom surface thereof which coacts with a similar bevel on an inner face of a bottom lip of said opening in said front wall, whereby when said beveled latch surface is in contact with said beveled lip surface said cover is in locked relationship with and completely covers said opening in said front wall, preventing access to said interior chamber,

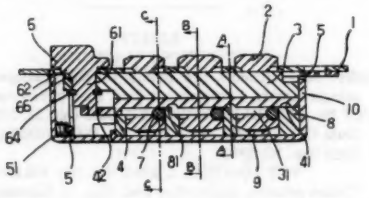
an arcuate cam surface on the bottom of said cover latch which when ramped upwardly disengages said beveled edge on said cover latch from said beveled face on said inner lip of said opening, whereby said cover pops open due to said spring disposed on said end of said web member.

4,532,784

COMBINATION LOCK

Ching C. Yeh, No. 139, Sec. 2, Chang Hsing Rd., Ho Mei Chen, Changhua, Taiwan

Filed Apr. 11, 1983, Ser. No. 483,538
Int. Cl.³ E05B *37/02*
U.S. Cl. 70—312 **1 Claim**



1. An improved combination lock comprising:

a surface plate having three holes respectfully for mounting three tumblers and an opening for mounting an actuating button having a pin, said opening being formed by two holes of different diameters in said surface plate connected by a slot of a width approximating the diameter of the smaller one of said two holes;

an actuating button having a protuberance adapted to be received in said opening and a pin extending below said protuberance, said pin having a groove engaged by a retaining ring and an eccentric pin extending below said groove, said actuating button being further provided with another protuberance for limiting rotating range thereof;

a mounting plate for installing a bolt, said mounting plate being connected with a spring at an end near said actuating button, one part of said mounting plate being at a right angle to another part of said mounting plate, said mounting plate having a protuberance at the end remote from said actuating button;

a bolt having a cylindrical main body, said bolt being provided with a keyway and three grooves extending thereabout, said bolt having a planar surface near said actuating button, with said planar surface having a hole with a diameter similar to that of said pin of said actuating button;

a slotted rod formed with a plain surface on which there are a circular groove for mounting said eccentric pin of said actuating button and a rod on which there are three slots;

a fixing frame of rectangular shape and having means to accommodate said bolt and forming three compartments in which are mounted said tumblers associated with said bolt, said means having upwardly extending protuberances positioned to hold metal balls;

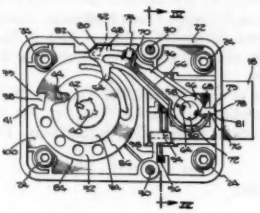
a metal ball for each of said grooves of said bolt;
a case for accommodating said fixing frame.

4,532,785

COMBINATION LOCK

Tim M. Uyeda, South San Gabriel, Calif., assignor to La Gard, Inc., Torrance, Calif.

Filed May 19, 1983, Ser. No. 496,171
Int. Cl.³ E05B *15/16, 63/00*
U.S. Cl. 70—333 R **15 Claims**



1. A lock assembly comprising:
a plurality of peripherally gated tumbler wheels supported for rotation about a common axis;
a peripherally gated control cam mounted to said common axis;
a bolt movable between an extended and a retracted position;
a fence lever having a first end adapted for rotatable mounting to said bolt and a second end having a fence for engagement with the peripheral gates on said tumbler wheels and a latch for engaging said peripheral cam gate only when said fence engages said peripheral tumbler wheel gates to provide cam operated movement of said bolt between said extended and retracted positions;
means for rotatably mounting said fence lever first end to said bolt;
spring means for serving the dual purpose of biasing said fence lever second end towards said control cam and securing said fence lever first end to said bolt;
a housing having a bolt opening through which said bolt is moved between said extended and retracted positions; and
means for precisely positioning said fence lever and bolt when said bolt is moved to said extended position, said precise positioning means including a detent extending outward from said fence lever first end having a face for abutting against said housing to position said bolt when said bolt is in said extended position to prevent further extension of said bolt.

4,532,786

METHOD FOR MANUFACTURING A VEHICLE WHEEL

Walter Schaible, Korntal, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

Filed Oct. 26, 1983, Ser. No. 545,680
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239675
Int. Cl.³ B21H *1/04*
U.S. Cl. 72—68 **4 Claims**

1. A method for manufacturing a one-piece vehicle wheel from light metal in which the wheel includes a hub portion and a rim portion, the method including pressing a wheel dish from a disk and forming a rim base from an edge of the disk, the forming of the rim base including the steps of bending the edge obliquely outwardly from a longitudinal plane of the wheel to form an outer edge portion, splitting the outer edge portion along the longitudinal plane of the wheel into two annular ring parts of substantially similar thickness with one of the ring parts having a larger accumulation of material associated with the distal end thereof, and extending the annular ring parts by

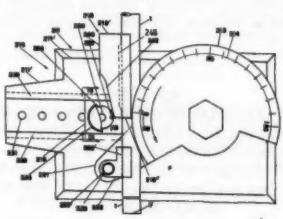
a rolling-pressing operation into a rim base having legs of different lengths and of generally equal thickness.

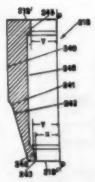
4,532,787

PORTABLE ELECTROMECHANICALLY-CONTROLLED PIPE-BENDING APPARATUS

Alessandro Caporusso, and Mario Caporusso, both of Frosinone, Italy, assignors to C.M.L. Costruzioni Meccaniche Liri S.r.l., Frosinone, Italy

Filed Mar. 9, 1982, Ser. No. 356,366
Claims priority, application Italy, Mar. 16, 1981, 48029 A/81; Nov. 12, 1981, 49701 A/81; Feb. 8, 1982, 47749 A/82
Int. Cl.³ B21D *7/04*
U.S. Cl. 72—158 **6 Claims**





1. A portable electromechanically-controlled pipe-bending apparatus for bending up to an angle of 180° pipes of materials which are particularly sensitive to the stretching stresses provided during a bending operation, comprising:
a. a main body in the form of a substantially parallelepiped-box wherein a driving motor-reducer is contained, on the output shaft of which is fastened the main bending matrix of the apparatus in order to be rotated at a suitable slow rotating speed;
b. said main bending matrix being in the form of a semi-pulley having a peripheral semicircular groove, which is driven in rotation by said driving motor-reducer about a first axis;
c. a second bending countermatrix which is provided with a concave groove facing said peripheral semicircular groove of the matrix and adapted to cooperate with the same so that a pipe to be bent may be held and bent therebetween when said matrix is rotated for a bending opera-

tion, the operative shaped surface of said countermatrix (218) comprising a shaped section (245) which begins on an input edge (218') of the countermatrix and has a cylindrical semicircular groove with the same radius (y) as the pipe to be bent and as said groove (214) of said matrix (213), and a shaped section (246) which begins from an output edge (218") of the countermatrix opposite from said input edge (218') with a shallower depth (x) and extends progressively up to the end of said section (246) wherein the radius (y) is again that of the pipe to be bent;

d. means to support said countermatrix for movement toward and away from said matrix so that said countermatrix can be set at the right distance from the matrix in accordance with the diameter of the pipe to be bent, said support means comprising a cylindrical support member (224), the operative side of said countermatrix lying on a longitudinal plane (p-p) which also comprises a longitudinal plane along the pipe to be bent, said countermatrix having, on its side opposite said operative side, a surface (242) that inclines away from said plane from said output edge (218") toward said input edge (218") and that terminates in a concave arcuate section (241) the radius of which is that of said cylindrical supporting member (224); and

e. a pipe supporting member having a rectilinear concave groove which is connected with said matrix through a base plate and has the function of an auxiliary means freely rotating on said base plate about a second axis parallel to said first axis so as to co-operate with said matrix and said countermatrix during a bending operation;

all these grooved co-operating bending members being interchangeable in accordance with the diameter of the pipe to be bent.

4,532,788

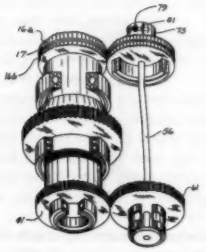
APPARATUS FOR MAKING SPINE FIN STOCK

Herbert J. Venables, III, Hunting Valley Village, Ohio, assignor to The Venables Machine and Tool Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 392,575, Jun. 28, 1982, abandoned. This application May 24, 1983, Ser. No. 497,574

Int. Cl.³ B21D *53/04*

U.S. Cl. 72—186 **17 Claims**



1. Apparatus for transversely slitting a ribbon of sheet stock comprising a pair of cutter rolls forming a nip therebetween and each having peripheral cutting teeth adapted to cooperate with teeth on the other roll to cut slits at a cutting station formed at the nip, means for rotatively supporting said rolls for counter-rotation about spaced axes, means for adjustably fixing the center-to-center distance between said rolls to thereby achieve a desired radial spacing between opposed teeth, and positive drive means operatively interconnected between said rolls and arranged to maintain a desired circumferential orientation between opposed teeth passing through the nip during counter-rotation of the rolls, said positive drive means including means to permit center-to-center adjustment of said rolls independent of the circumferential orientation of opposed teeth in the nip, said drive means including a set of intermeshed gears each associated with one of said cutter rolls and each supported for rotation about an axis parallel to the axis of its associated roll, said gear supporting means at one of said gears including means to adjustably determine the center-to-center distance between said pair of gears, said drive means and gear supporting means being arranged to permit center-to-center adjustment of said pair of gears to be accomplished independent of the center-to-center spacing of said cutter rolls.

4,532,789

PROCESS FOR REDUCING THE WIDTH OF A FLAT METAL PRODUCT BY ROLLING

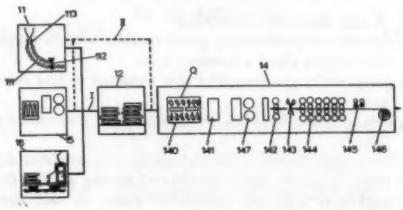
Hans Bruinsma, Uitgeest; Frans Hollander, Castricum; Rein L. Huisman, and Adrianus G. Reinen, both of Beverwijk, all of Netherlands, assignors to Estel Hoogovens B.V., Ijmuiden, Netherlands

Continuation of Ser. No. 238,965, Feb. 27, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 506,583

Claims priority, application Netherlands, Feb. 28, 1980, 8001197

Int. Cl.³ B21B *27/06*

U.S. Cl. 72—202 **14 Claims**



10. In a process of hot rolling steel strip from a slab comprising heating the slab in a reheating furnace and thereafter rolling the hot slab into a strip in a finishing train having a plurality of roll stands in which the width of the slab is not substantially altered, the improvement comprising heating the slab in the reheating furnace, rolling the slab in a width-reducing roll train having at least one set of flat width rolls and only one set of thickness rolls and applying a traction force to the slab between a set of width rolls upstream of said thickness rolls and said thickness rolls so that plastic deformation of the slab occurs between the sets of rolls in the width-reducing roll train prior to rolling in said finishing roll train.

4,532,790

SPRING-LOADED GROUND ENGAGING TOOL

Douglas C. Nicholls, Yorkton, Canada, assignor to Morris Rod Weeder Co. Ltd., Yorkton, Canada

Filed Nov. 22, 1983, Ser. No. 554,283

Int. Cl.³ A01B *61/04*

U.S. Cl. 172—266 **3 Claims**

1. In an agricultural implement having a support,

a mount;

means for securing the mount to the support; and

a ground working assembly including:

an elongated arm extending at an angle downwardly and rearwardly from said mount,

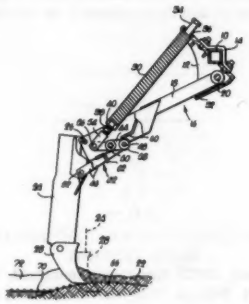
an elongated, normally upright shank,

pivot means at the lower end of the arm suspending the shank therefrom at the upper end of the shank for fore and aft swinging movement of the shank relative to the arm,

a ground working tool joined to the shank at the lower end of the latter,

a releasable locking device disposed forwardly of the shank and carried by said arm beneath the upper extremities of the latter,

said device including a pair of pivotally interconnected links,
there being an upper link and strap link,
means swingably mounting the upper link on the arm,
means pivotally connecting the strap link with the shank intermediate said ends of the shank,
said strap normally extending at an angle downwardly and rearwardly from the arm to the shank,
resilient means between the mount and the assembly yieldably biasing the latter downwardly,



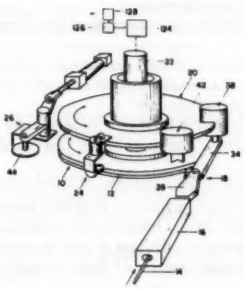
said resilient means being pivotally connected to said upper link and abutting the mount, and
means at the upper end of the arm pivotally connecting the same to the mount adjacent and beneath the support for up and down swinging movement of the assembly relative to the mount toward and away from the ground to be worked,
whereby the assembly provides, in combination, cushioning of the tool during normal operation and automatic tripping of the assembly when the tool encounters obstacles in the path of the tool.

4,532,791

ARRANGEMENT AND OPERATION THEREOF FOR THREADING A ROTATABLE ASSEMBLY

James L. McLaughlin; Donald J. Custer, both of Akron, and Richard J. Donze, Stow, all of Ohio, assignors to Morgan Construction Company, Worcester, Mass.

Filed Oct. 26, 1983, Ser. No. 545,711
Int. Cl.³ B21C *1/14*
U.S. Cl. 72—275 **21 Claims**



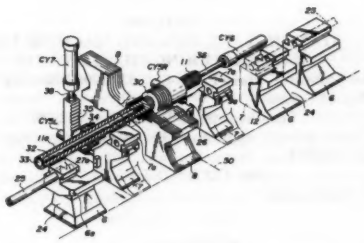
1. In a drawing arrangement for reducing elongated strand material, such as wire or tubing, comprising:
a die assembly through which said material is continuously drawn throughout a drawing process,
a rotatable block assembly located downstream from said die assembly having a cylindrial surface around which a length of said material is substantially wrapped so that a desired drawing tension is created to pull said material through said die assembly,
drive means for rotating said block assembly,
rotatable plate means constructed and arranged to be in close proximity and co-axial to said rotatable block assembly,
gripper means carried by said plate means constructed and arranged in a manner to selectively grasp a tapered end of said strand material immediately exiting said die assembly for threading phase of said drawing process and to release said tapered end after said threading phase, and
a shearing device carried by said plate means constructed and arranged in a manner to cooperate with said gripper means in a time sequence relationship during said threading phase to sever said tapered end from said length of said material after said length is arranged around said rotatable block assembly prior to said releasing of said end by said gripper means;
power transmitting means on said plate means or said block assembly for selectively causing said plate means to be engageable and disengageable with said rotatable block assembly, and constructed and arranged in a manner that upon said engagement said plate means rotates with said block assembly as a unit in the same direction and said gripper means places said strand of material on said cylindrical surface of said block assembly,
said power transmitting means including means for automatically effecting the disengagement of said plate means from said block assembly upon a predetermined rotation of said block assembly without interrupting said rotation of said block assembly.

4,532,792

APPARATUS FOR ADJUSTING TO TOOL LENGTH OF PANEL FORMING MACHINE

Toshio Hongo, Ichikawa, Japan, assignor to Maru Kikai Kogyo Co., Ltd., Japan

Filed May 31, 1983, Ser. No. 499,773
Claims priority, application Japan, Sep. 8, 1982, 57-136452[U]
Int. Cl.³ B21D *11/04*
U.S. Cl. 72—319 **6 Claims**



1. A tool length exchanging device in a forming machine for bending the edge of a metal sheet comprising:
a ram (4) having a lower end,
a top tool body (5) mounted on the lower end of said ram (4),
a bottom tool (2) mounted below the top tool body (5),
a top tool including a group of top tool segments (6) slideable in a transverse direction of said top tool at the lower end of said body (5),
a number of thin top tool segments (8) invertably mounted at the center of said group of said top tool segments (6), each of said thin top tool segments having a thin width substantially less than each of said top tool segments,
a movable tool (3) rotating at 90° around both of said top

tool and said bottom tool (1, 2) and said top and bottom tools retaining the metal sheet (40),

a sheet finger driving mechanism (14) provided at the front of said body (5) to slide said top tool segments (6) in said transverse direction of the tool, and an inverting mechanism (32, 34, 35, Cy 7) provided at the rear side of said top tool body (5) to invert a predetermined number of said thin top tool segments (8) in a direction other than said transverse direction.

4,532,793

METHOD FOR DEEP-DRAWING SHEET METAL AND AN APPARATUS FOR CARRYING OUT THE METHOD

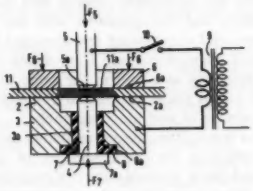
Helmut Bezold, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Filed Sep. 22, 1983, Ser. No. 534,549

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235716; Jul. 18, 1983, 3325820

Int. Cl.[3] B21D *24/00*

U.S. Cl. 72—342 2 Claims



1. Method for deep-drawing sheet metal in a drawing apparatus having a drawing ring body, a pressure body, a drawing plunger, and a counter plunger, which comprises pushing a metal sheet having a deep-drawing region against the drawing ring body with the pressure body surrounding the deep-drawing region, pushing the drawing plunger and the counter plunger along the longitudinal axes thereof against the deep-drawing region for clamping substantially the center of the deep-drawing region from opposite sides of the metal sheet, and heating the deep-drawing region with an electric current flowing between at least one of the plungers and at least one of the bodies as well as through the deep-drawing region for deep-drawing.

4,532,794

STAMPING AND BENDING MACHINE FOR MANUFACTURING SHAPED PARTS

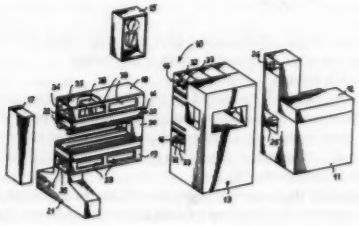
Ernst Mauderer, Hans-Pfann-Str. 62, 8000 München 82, Fed. Rep. of Germany

Filed Sep. 19, 1983, Ser. No. 533,787

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1982, 3234981

Int. Cl.[3] B21D *5/00, 28/00*

U.S. Cl. 72—442 9 Claims



1. An improved stamping and bending machine of the type having several interchangeable bending appliances arranged one behind the other, each supporting, adjustably and interchangeably, at least one bending attachment having a rotating shaft coupled with a bending appliance gearing to define a driving mechanism, every bending appliance having coaxial drive shaft stub ends at opposite sides, one of which ends will be coupled with the drive shaft stub end of the contiguous bending appliance, of one of the stamping press and a central drive unit, the improvement wherein each bending appliance comprises a top and a bottom shaft parallel to each other, and each bending attachment including a take-off gearing operatively connected to and driven directly by one of the top and bottom shaft.

4,532,795

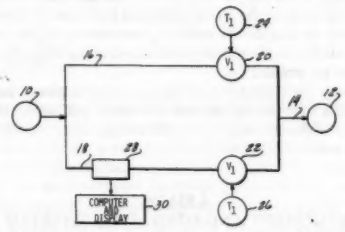
METHOD OF TEMPERATURE COMPENSATING LEAK RATE TESTING

Semyon Brayman, 28023 Berkshire, Southfield, Mich. 48076, and Ronald N. Bullock, 7520 Merrick, Taylor, Mich. 48180

Filed Apr. 23, 1984, Ser. No. 602,712

Int. Cl.[3] G01M *3/26*

U.S. Cl. 73—40 4 Claims



1. A method of temperature compensating measurements of leak rates from a cavity in a part to be leak tested, said leak rate measurements achieved by placing said cavity in communication with a source of fluid under a predetermined pressure and measuring the flow rate to said cavity from said source, said method comprising the steps of:

initially establishing a temperature compensating function by:

placing said source of fluid pressure in communication with the cavity of a sample part, at each of a plurality of temperatures of said sample;

measuring the shift in flow rate to said cavity of said sample part caused by a change between said plurality of temperatures;

measuring each of said plurality of temperatures;

generating by linear regression from said measured temperatures and flow rates a temperature compensation function;

placing the cavity of each part to be leak tested in communication with said source of fluid at said predetermined pressure;

measuring the flow rate to said cavity from said source of fluid at said predetermined pressure;

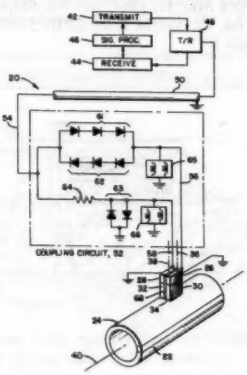
measuring the temperature of said part to be tested;

applying a temperature compensation factor from said generated temperature compensation function corresponding to said measured flow rate, whereby a temperature corrected flow rate to said cavity is determined.

4,532,796
DUAL TRANSDUCER CONNECTION BY A SINGLE CABLE

George D. Martens, New Milford; Alexander B. Smith, Milford, and Thomas D. Healy, Norwalk, all of Conn., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Nov. 7, 1983, Ser. No. 548,939
Int. Cl.[3] G01N *29/04*
U.S. Cl. 73—632 3 Claims



1. A coupling circuit for coupling a relatively large outgoing signal from one terminus of an electrical cable to a first device, and for coupling a relatively small incoming signal from a second device to said cable via said first terminus, said coupling circuit comprising:

a first channel and a second channel, said first channel being connectable between said one terminus and said second device, said second channel being connectable between said first terminus and said second device; and wherein

said first channel comprises a set of serially connected diodes being poled for the conduction of current of said outgoing signal towards said first device; and

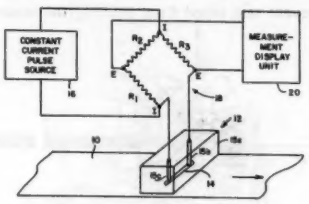
said second channel comprises a set of oppositely poled diodes connected in parallel across terminals of said second device, and a resistor connecting one node of said set of parallel diodes to said one terminal for attenuating any propagation of an outgoing signal in said second channel while said set of serially connected diodes attenuates any incoming signal propagating in said first channel, said outgoing signal having a voltage amplitude larger than the forward voltage drop of said serially connected diodes, the incoming signal from said second device having a voltage amplitude smaller than the forward voltage drop of said parallel connection of diodes.

4,532,797
INSTRUMENTATION FOR SENSING MOISTURE CONTENT OF MATERIAL USING A TRANSIENT THERMAL PULSE

Lien C. Yang, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 325,885, Nov. 30, 1981, abandoned.
This application Dec. 22, 1983, Ser. No. 563,890
Int. Cl.[3] G01N *25/56*
U.S. Cl. 73—75 10 Claims

1. A transient method of measuring the moisture content of material using a short current pulse through a sensor having an element that is thermally and electrically conductive, the resistance of which varies as a function of its temperature, comprised of determining the resistance of said element on application of a short pulse of constant current energy, placing said element in thermal contact with said material, heating said element with said short pulse of constant current energy, determining the peak change in resistance of said element during the application of said short pulse of current while said element is

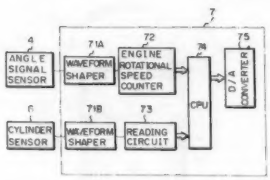


in contact with said material and always previous to any thermal equilibrium that would be reached by said element while in contact with said material, said peak change being a measure of moisture content of said material.

4,532,798
MEASUREMENT OF VARIATIONS IN INTERNAL COMBUSTION ENGINE OUTPUT

Tokio Kohama, Nishio; Hideki Obayashi, Okazaki; Hisasi Kawai, Toyohashi; Toshikazu Ina, Aichi; Takashi Shigematsu, and Setsuo Tokoro, both of Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed May 31, 1984, Ser. No. 615,910
Claims priority, application Japan, Jun. 8, 1983, 58-100965; Jun. 16, 1983, 58-106699; Jun. 16, 1983, 58-106700
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—116 14 Claims



1. A method for measuring variations in output of an internal combustion engine, comprising the steps of: obtaining at least one of signals representing engine rotational speed, engine torque, and an internal cylinder pressure during firing strokes of the internal combustion engine; detecting periodical and pulsating changes in the obtained signal; and calculating a differential value of the change in the obtained signal at the portion where the gradient of the change is maximum.

4,532,799
LIQUID LEVEL SENSOR

Michael J. O'Neill, Wilton, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 17, 1983, Ser. No. 506,232
Int. Cl.[3] G01F *23/24*
U.S. Cl. 73—295 2 Claims

1. An apparatus for use in remotely determining the level of a liquidified gas said apparatus comprising, in combination:

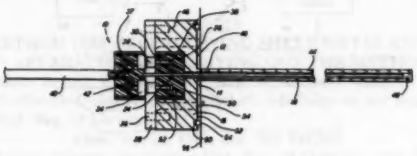
an elongated thin-walled hollow tubular metallic core;

an elongated sensor element in the form of a small diameter wire wound about, adjacent and coaxial with said core;

an elongated heating coil in the form of a wire wound about, adjacent and coaxial with said sensor element, said sensor

element and said heating coil being electrically insulated but in thermally conductive relationship with respect to each other;

an elongated probe sheath surrounding said tubular core and said sensor element and said heating coil to isolate said sensor element and said heating coil from said liquid and to prevent said liquid from entering the interior of said core;



said tubular core, sensor element, heating coil and probe sheath being partially immersible in the liquid whose changes in level are to be detected;

means for energizing said heating coil;

means for determining the ohmic resistance of said sensor element;

a base assembly including means for connecting said sensor element and said heating coil thereto; and

means for sealingly mounting said base assembly to a wall of a reservoir for containing said liquid.

4,532,800

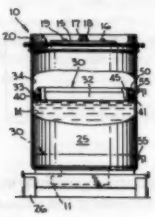
LEVEL INDICATOR FOR LIQUID CONTAINER WITH A FOLLOWER

Clarence B. Coleman, Oakland, Calif., assignor to Fabricated Metals, Inc., San Leandro, Calif.

Filed Dec. 1, 1983, Ser. No. 557,045

Int. Cl.³ B65D *88/42;* G01F *23/12*

U.S. Cl. 73—308 **4 Claims**



1. A container for bulk material comprising:

(a) a shell for storing bulk material, said shell being formed with an upright cylindrical wall having an inner surface and an outer surface and a bottom wall, said bottom wall provided with means for removing the bulk material from the shell;

(b) a diaphragm follower disposed in said shell and dimensioned to engage flexibly the inner surface of said shell for wiping the inner surface of said shell as the bulk material is removed from said shell, said follower being movable over a vertical rectilinear path in constant contact with the upper surface of the bulk material stored in said shell;

(c) a magnet mounted on said follower interiorly of said shell for movement therewith; and

(d) means responsive to the magnetic field of said magnet and supported by said wall along said outer surface, said means connected to level indicating means, said means being activated by the magnetic field of said magnet when said follower moves to the approximate height of said means.

4,532,801

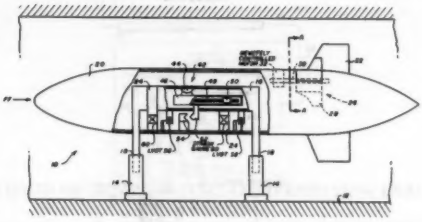
METHOD AND APPARATUS FOR DETERMINING SMALL MAGNITUDE FLUID-DYNAMIC DRAG RESISTANCE DIFFERENTIALS BETWEEN DIFFERENT STRUCTURAL CONFIGURATIONS OF A MODEL

David W. Coder, Bethesda; Benjamin B. Wisler, Jr., Cabin John; Albert P. Clark, Bethesda, and Raymond J. Ratcliffe, Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1984, Ser. No. 611,444

Int. Cl.³ G01M *9/00;* G01N *33/00*

U.S. Cl. 73—432 R **12 Claims**



1. An apparatus for determining small magnitude fluid-dynamic drag resistance differentials acting on a variable model mounted in an environmental test facility, said environmental test facility including means for mounting said variable model therein, comprising:

a configuration conversion mechanism disposed within said variable model and cooperating therewith to alternately convert said variable model to a baseline configuration and a modified baseline configuration;

a nulling force mechanism disposed within said variable model and cooperating with said variable model and said mounting means to be selectively apply a nulling force to said variable model to null out a total fluid-dynamic drag resistance acting on said variable model due to a predetermined fluid flow in said environmental test facility such that said variable model is returned to an undeflected position; and

means for measuring deflections of said variable model caused by said small magnitude fluid-dynamic drag resistance differentials acting thereon, said measuring means being disposed within said variable model and cooperating with said variable model and said mounting means,

whereby after said predetermined fluid flow is initialized and stabilized in said environmental tunnel and said nulling force is applied to said variable model by said nulling force mechanism to return said variable model to said undeflected position, said variable model is alternately converted to said baseline configuration and said modified baseline configuration and said small magnitude fluid dynamic drag resistance differentials acting thereon to cause deflections of said variable model are measured by said deflection measuring means.

4,532,802

APPARATUS FOR ANALYZING THE INTERFACE BETWEEN A RECORDING DISK AND A READ-WRITE HEAD

Celia E. Yeack-Scranton, South Salem, N.Y., and Siegfried F. Vogel, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 31, 1984, Ser. No. 615,638

Int. Cl.³ G01B *5/28;* G01N *19/08*

U.S. Cl. 73—432 R **15 Claims**

1. An improved apparatus for testing a recording disk for determining its quality, said apparatus comprising:

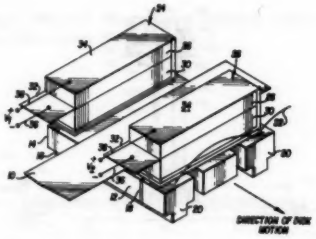
means for rotating such a disk;

means for simulating the geometry, weight and material properties of a read-write head;

means for moving said means for simulating to preselected positions across the surface of a recording disk while the disk is rotating on said means for rotating, whereby said means for simulating is spaced from the surface of the disk at a specified fly height due to rotation of the disk;

at least one piezoelectric transducer means, mounted on said means for simulating, for producing first signals in response to acceleration or flexure or both by said means for simulating, due to movement of said means for simulating relative to or contact thereof with the rotating disk, or both; and

means connected to said transducer means for selectively filtering said first signals to produce:



second signals in a first frequency range in which spectral components of said first signals are indicative of rigid body accelerations of said means for simulating;

third signals in a second, usually higher frequency range in which spectral components of said first signals are indicative of contacts between the disk and the means for simulating; and

fourth signals in a third frequency range between said first and second ranges, in which RMS spectral components of said first signals are indicative of the roughness of flight of said means for simulating over the surface of the disk,

where the frequency ranges are determined by the geometry of particular slider/transducer assembly chosen.

4,532,803

NON-SPINNING DYNAMIC BALANCING MACHINE AND METHOD

Richard P. Woolley, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jan. 9, 1984, Ser. No. 569,486
Int. Cl.[3] G01M *1/16*
U.S. Cl. 73—471 **13 Claims**

1. Apparatus for detecting imbalance in an object comprising:

first means for supporting said object;

second means for supporting said first means;

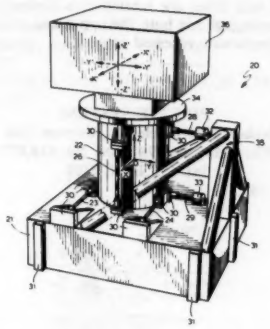
a base for supporting said second means;

a plurality of strut means coupling said second means to said base, said plurality of strut means including first strut means for holding said second means against translation in the direction of a vertical axis and against rotation about a first horizontal axis, second strut means for holding said second means against translation in the direction of a second horizontal axis and against rotation about the vertical axis, and third strut means for holding said second means against translation in the direction of said first horizontal axis and against rotation about said second horizontal axis;

means for angularly oscillating said first means and said object supported thereby relative to said second means;

detecting means coupled to said third strut means for detecting reaction forces exerted in the direction of said first horizontal axis and reaction torques exerted around said second horizontal axis as a result of effects caused by imbalance in said object; and

means for uncoupling said first means from said second



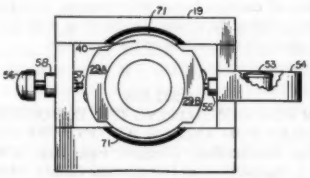
means for rotating said first means and said object supported thereby to different orientations relative to said second means to enable all horizontal reaction torques and forces to be detected.

4,532,804

DEVICE FOR RETAINING A TOOL IN EITHER A STATIONARY OR MOVABLE POSITION

Louis D. Wilson, and Patrick M. Jones, both of Folsom, Calif., assignors to Drive Line Service, Inc., West Sacramento, Calif.

Filed Jan. 6, 1984, Ser. No. 568,926
Int. Cl.[3] G01M *1/04, 1/16*
U.S. Cl. 73—478 **6 Claims**



1. A locking and dynamic balancing assembly comprising a rotatable annular shell and a rocker bearing support for said rotatable shell;

said support comprising a pair of spaced elongated upper and lower members interconnected at their ends, the lower elongated member having a central curved support section with a rocker surface adapted to receive said annular shell, and having a pair of similar arcuate recessed zones of a different radius of curvature from said support section disposed forwardly and rearwardly of said support section;

said rotatable annular shell disposed within said rocker bearing support, within which shell is an inner race carrying a plurality of ball bearings,

said shell having a pair of spaced arcuate concentric lobes extending outwardly on opposite sides of the outer surface of said shell, said lobes being rotatable from a first position to a second position,

the radius of said annular shell being designated R_2 and the central support section of the lower member of the rocker bearing support having a radius of curvature R_3 which is greater than R_2,

the radius of said lobes corresponding to the radius of curvature of said recessed zones;

whereby when said lobes are rotated such that the annular shell is in an unlocked position, the outer surface of said annular shell rests on the curved central support section of the lower member of the rocker bearing support, and is restrained only by gravity force;

and when said lobes are rotated to a locked position, the lobes are engaged in both the upper and lower elongated member's arcuate recessed zones.

4,532,805

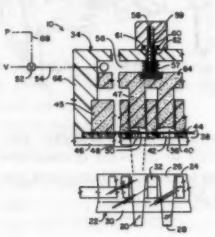
PIPETTE SYSTEM

Robert W. Flesher, 1836 Circle Rd., Towson, Md. 21204

Filed May 29, 1984, Ser. No. 615,070

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—863.32 **23 Claims**



22. In a system for micropipetting, of the type having structure defining a plurality of cavities, a membrane positioned from being drawn into the plurality of cavities, means for drawing the membrane into the plurality of cavities, and means connected with the membrane for metering fluid samples in proportion to the drawing of the membrane into the plurality of cavities, the improvement comprising: the structure defining the plurality of cavities being microporous structure, and a manifold associating the means for drawing with the plurality of cavities through the microporous structure.

4,532,806

SENSOR FOR MONITORING THE DEPOSITION OF FROZEN FOG AND/OR ICE ON SURFACES

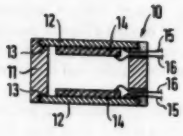
Hans-George Bruchmüller, Giengen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Munich, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,546

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3205370

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—579 **8 Claims**



1. Sensor for monitoring the deposition of frozen fog and/or ice on evaporator surfaces, comprising a can-shaped housing having opposite sides, means for heat conductingly connecting said housing to the evaporator, first and second membranes respectively disposed at said opposite sides of said housing, first and second electroacustic transducers each being attached to a respective one of said membranes, and means for applying alternating voltage to said first transducer causing said first transducer to oscillate said first membrane, said second membrane being spaced from said first membrane by a distance permitting oscillation of said first membrane to oscillate said second membrane.

4,532,807

METHOD AND APPARATUS FOR DETECTING SOUND SOURCE

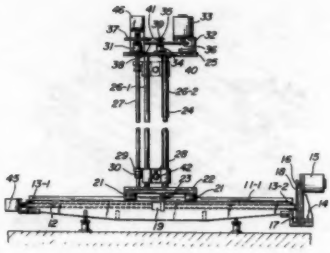
Naotaka Tomita, Sayama, and Toshiyuki Watanabe, Tokorozawa, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,609

Claims priority, application Japan, Oct. 1, 1982, 57-172694

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—602 **11 Claims**



7. An apparatus for detecting a sound source comprising:

at least two microphones;

a traversing device for supporting said microphones and for moving said microphones in a two-dimensional manner to scan successive measurement regions in a measurement plane wherein said two microphones being spaced apart from each other in a direction substantially perpendicular to said measurement plane;

a fast Fourier transform circuit for calculating a cross power spectrum with respect to various frequencies in a given frequency range on the basis of outputs of said two microphones in respective measurement regions;

a computer for calculating acoustic intensities with respect to various frequencies in said respective measurement regions on the basis of said cross power spectrum derived from said fast Fourier transform circuit;

a storing means for storing said acoustic intensities with respect to various frequencies together with positional information of said two microphones arrange on said traversing device; and

a display device for indicating selectively said acoustic intensities with respect to respective frequencies in all the measurement regions stored in said storing means.

4,532,808

CORNER REGION ULTRASONIC INSPECTION DEVICE

Timothy H. Wentzell, South Windsor, and Mark V. Brook, West Hartford, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 13, 1983, Ser. No. 541,406

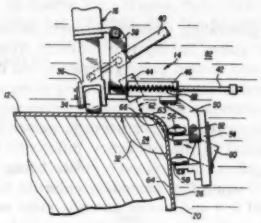
Int. Cl.³ G01N *29/04*; G21C *17/00*

U.S. Cl. 73—640 **7 Claims**

7. A method for detecting radially oriented cracks beneath the corner region formed by the intersection of two cylindrical conduits, comprising the steps of:

transmitting a beam of ultrasonic sound energy into the corner region at an angle oblique to the inner surface of the first conduit and skewed with respect to the plane defined by the centerlines of the first and second conduits, and

directionally monitoring the surface of the second conduit for detecting the presence of reflected ultrasonic sound



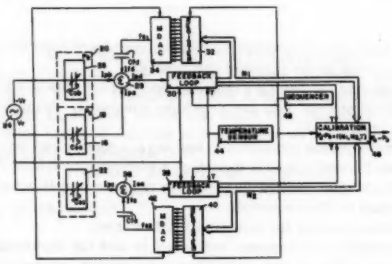
energy reflected by radially oriented cracks present within the corner region.

4,532,809

PRESSURE MEASURING SYSTEMS WITH INCREASED ACCURACY FOR A CONSTANT RESOLUTION

Frank J. Antonazzi, and Sudesh Bose, both of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Oct. 5, 1981, Ser. No. 308,751
Int. Cl.³ G01L *9/12*
U.S. Cl. 73—701 **24 Claims**



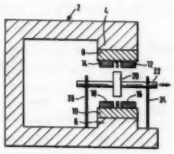
1. A pressure measuring system comprising first pressure sensing means for sensing a first pressure, second pressure sensing means for sensing a second pressure, means responsive to said first and second pressure sensing means for generating first and second pressure signals, means responsive to the first and second pressure signals, for generating a combining signal representing a combined variable which varies as a function of both said first and second pressure measurement signals, common mode sensing means for sensing said first pressure, common mode signal generating means responsive to said common mode sensing means for generating a common mode signal as a function of said first pressure, and calibration means responsive to said combining signal and said common mode signal for calibrating the combining signal as a function of the value of said common mode signal.

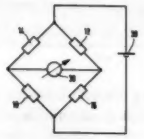
4,532,810

DEVICE FOR THE PICK-UP OF MEASURED VALUES

A. F. Rudolf Prinz, and Rudolf M. Charvat, both of Brunswick, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Jul. 1, 1983, Ser. No. 510,360
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224757
Int. Cl.³ G01B *5/00, 7/14;* **G01D** *5/20;* **G01L** *9/00*
U.S. Cl. 73—717 **20 Claims**





1. A device for the pickup of measured values having a frame as carrier for a first measurement reference, a carrier for a second measurement reference being movably mounted relative to said frame.

a mechanical to electrical conversion system provided at said frame, having a first element attached to said frame and a second element attached to said movably mounted carrier, including

two pairs of field plates, the field plates of each pair being located at a distance parallel to each other, said two pairs of field plates being arranged oppositely to each other on opposite parallel pole surfaces in the frame so that an air gap is present between said oppositely arranged two pairs of field plates;

magnetic means, the magnetic field of which is present at the pairs of said field plates and said air gap,

an armature connected to said carrier for a second measurement reference and being movable transversely with respect to said parallel pole surfaces in said air gap between said two pairs of field plates and in the general direction in which the field plates of each pair of field plates are separated and in the area between the field plates of each of said two pairs of field plates, whereby said armature causes the magnetic flux through the field plates to be varied depending on the position of said first and second measurement references relative to each other,

a bridge circuit having the field plates as elements, adapted to be connected to display and/or recording means for measured values of one diagonal of said bridge circuit, while voltage is applied to the other diagonal.

4,532,811

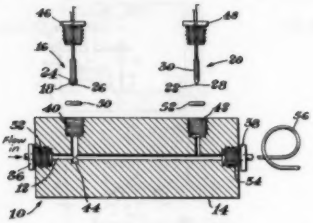
APPARATUS FOR METERING SUB-10 CC/MINUTE LIQUID FLOW

Theodore E. Miller, Jr., and Hamish Small, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 6, 1981, Ser. No. 280,668
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—861.05 **18 Claims**

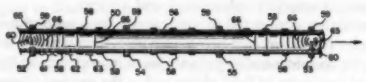
1. Apparatus for electronically metering volumetric liquid flow, which comprises:

(a) a flow cell having a flow-through passage;
(b) a resistance heating means comprising a semiconductor heating element, and circuit means to operate the semiconductor element as a resistance pulse heater, the resistance heating means having a heat emitting surface which is exposed in the flow passage;
(c) a heat sensing thermistor, and circuit means to operate the thermistor in the heat sensing mode, the heat sensing thermistor having a heat sensing surface which is exposed in the flow passage in fixed, spaced relationship with the heat emitting surface of the resistance heating means;



(d) a differentiating circuit means for outputting an electrical pulse signal which in magnitude is proportional to dR_t/dt, or a time derivative thereof, wherein dR_t/dt is the time rate of change of the resistance of the heat sensing thermistor with pulse temperature change in the liquid to be metered;
(e) said circuit means operating the resistance heating means comprising a timer circuit means which is activated by each event of a sensible outputted pulse of circuit means (d), to apply a timed voltage pulse to the resistance heating means.

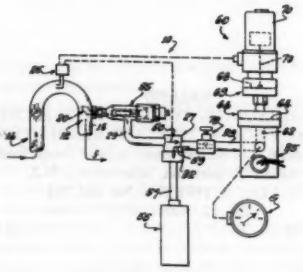
4,532,812
PARAMETRIC ACOUSTIC FLOW METER
James R. Birchak, Spring, Tex., assignor to NL Industries, Inc., New York, N.Y.
Filed Jun. 30, 1983, Ser. No. 509,520
Int. Cl.[3] G01F *1/66*; E21B *47/00*
U.S. Cl. 73—861.27 **29 Claims**



1. Apparatus for measuring the velocity of a fluid flowing along a select region of a conduit by the utilization of acoustic pulses and application of the Doppler principle, said apparatus comprising:
transducer means comprising first and second acoustic pulse generation transducers longitudinally disposed on said conduit for producing combined dual frequency, primary acoustic pulses;
receiver means for receiving and detecting secondary acoustic pulses propagated in said fluid, said receiver means being longitudinally disposed on said conduit and longitudinally spaced relative to said transducers; and
means for directing said primary, dual frequency acoustic pulses toward a select region adjacent the walls of said conduit for generation of said secondary acoustic pulse within said fluid at the difference frequency between said primary pulses, said secondary pulses propagating axially from said region to said receiver means for determination of fluid flow velocity.

9. A method of measuring the flow of fluid along a conduit by utilizing Doppler shift principles comprising the steps of:
providing first and second acoustic pulse generators upon said conduit disposed longitudinally one from the other;
providing first and second acoustic pulse receivers upon said conduit;
alternately generating primary acoustic pulses comprising combined pulses having two different frequencies with said first and second pulse generators and directing said primary pulses into the fluid flowing along said conduit;
generating secondary acoustic pulses within said fluid of said conduit from the primary acoustic pulses having a frequency equal to the frequency difference between the primary pulses, said primary pulses being of sufficient strength to cause said secondary pulses to propagate axially to said first and second acoustic pulse receivers; and
detecting the pulse propagation between said pulse generators and said receivers and determining fluid flow rate from the Doppler shift thereof.

4,532,813
KINETIC FLUID SAMPLER
Nerl D. Rinehart, Bakersfield, Calif., assignor to Alpha Gauge & Instrument Company, Bakersfield, Calif.
Filed Jan. 3, 1984, Ser. No. 567,776
Int. Cl.[3] G01N *1/14*
U.S. Cl. 73—863.02 **15 Claims**



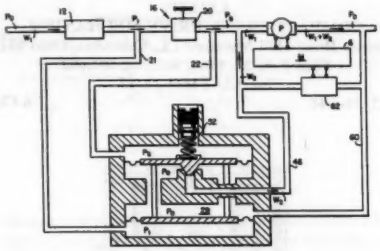
1. Apparatus for collecting discrete samples of fluid flowing in a conduit under pressure comprising:
a tap, said tap having a collector end thereof disposed in the fluid stream, said tap extending outwardly through the conduit wall;
sampler means connected to said tap at a remote end thereof, said sampler means including a plenum into which fluid from said conduit flows under pressure and is accumulated to form a sample;
collector means for receiving fluid samples;
switchable valve means interposed in said tap intermediate said collector end and said sampler means, and interconnected with said collector means so as to selectively direct fluid samples into said collector means;
said switchable valve means being operable between a receiving position to provide a fluid connection between said collector end and said sampler means to thereby permit fluid from the conduit to flow into and accumulate in said sampler means and a discharge position so as to interconnect said sampler means and said collector means to form a discrete isolated fluid sample under a predetermined pressure;
means in said conduit upstream from said tap for measuring fluid flow including signal means for transmitting electrical impulses to said switchable valve means upon passage of a predetermined volume so as to cycle said switchable valve means between its receiving position and its discharge position so as to sequentially accumulate and thereafter discharge periodic fluid samples.

4,532,814

FLUID SAMPLER AND GAS FLOW CONTROL SYSTEM AND METHOD

Hill S. Lalin, 10 Bonita Ter., Wayne, N.J. 07470

Filed Jul. 12, 1983, Ser. No. 512,935
Int. Cl.³ G01N *1/24*
U.S. Cl. 73—863.03 **17 Claims**



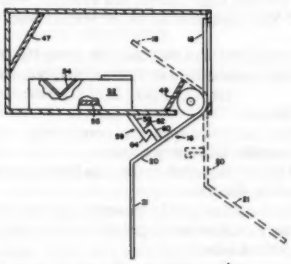
1. A fluid sampler for use in sampling a gaseous atmosphere in a collecting device at a constant preselected flow rate comprising: a flow control valve having a manually adjustable flow restricting orifice for preselecting said flow rate; a vacuum pump having a suction end and a discharge end and being connected in series with said flow control valve and the collecting device for drawing gas from the atmosphere through a primary flow line including, in combination, the collecting device, the flow control valve and the pump; means for sensing the pressure differential across said flow control valve; and a flow controller connected across the pump and being responsive to said sensing means for supplying a supplementary flow of gas from the discharge end of the pump into the suction end of the pump such that the flow through the pump equals the combination of the supplementary flow and the primary flow, with the flow controller having valve means for varying said supplementary flow in response to changes in pressure in said sensing means whereby the flow through said collecting device is maintained constant at said preselected flow rate.

4,532,815

DETONATION PRODUCTS CATCHER

Gary W. Gee, Huntsville; Daniel L. Shumate, Redstone Arsenal; John J. Nieder, Huntsville; Boyd E. Bump, Huntsville, and Robert D. Kource, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1983, Ser. No. 564,619
Int. Cl.³ G01L *5/14*
U.S. Cl. 73—864.63 **6 Claims**



1. Apparatus for trapping a sample of detonation products which precedes the shock front during the detonation process comprising:

a. a rigidly mounted box, said box having substantially parallel upper and lower surfaces and substantially parallel sides, a closed aft end and an open forward end;

b. a container carried in said box for retention of said detonation products therein;

c. a pivotably mounted door having upper, lower and central sections disposed in angular relation, said upper door section carried in said box adjacent said open forward end, said central and lower sections of said box disposed outside of said box below said lower surface thereof, whereby responsive to said shock front applying pressure to said central and lower sections of said door, said door is moved to a closed position for retention of said detonation products in said box; and

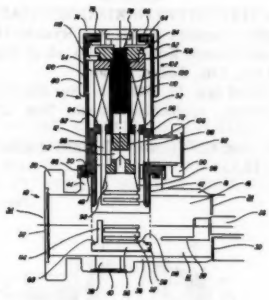
d. locking means associated with said door and said box for retention of said door in said closed position.

4,532,816

SAMPLE VESSEL

Mark C. Miller, Chanhassen, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 25, 1983, Ser. No. 516,827
Int. Cl.³ G01N *37/00, 1/00*
U.S. Cl. 73—864.91 **22 Claims**



1. A sample vessel comprising:

an elongated hollow housing having two ends, one end thereof having an opening therethrough;

a carrier plate slidably positioned within said housing, said plate including means for supporting a specimen holder;

means for sealing said housing opening;

means, within said housing, for longitudinally translating said carrier plate; and

means distal said opening and located relatively closer to the end of said housing opposite to the open end to simultaneously control said translating means and said sealing means to seal said housing when a specimen holder carried by said carrier plate is within said housing, the seal being such that when said housing gets sealed the specimen holder is located interior to the sealed exterior of said housing.

4,532,817

TUNING SHAFT OF PUSHBUTTON TUNER

Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

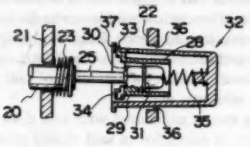
Filed Nov. 2, 1982, Ser. No. 438,438
Claims priority, application Japan, Nov. 6, 1981, 56-164912[U]
Int. Cl.³ F16H *35/18;* G05G *1/10;* F16D *11/04;* H03J *5/06*
U.S. Cl. 74—10.33 **2 Claims**

1. A tuning shaft for use in switch-type pushbutton tuners which comprises:

a tuning shaft portion;

a clutch shaft portion engageable with a pushbutton of said pushbutton tuner;

said tuning shaft portion and said clutch shaft portion being formed in one single body, said clutch shaft portion being configured in a regular polygon in its section, wherein one end of said clutch shaft portion nearer to the tuning shaft



portion includes an axially straight surface and a sloping surface dully sloping down therefrom toward the periphery of the tuning shaft portion, and the boundary between each sloping surface and each associated axially straight surface of the clutch shaft portion is chamfered to form an arc.

4,532,818

CLUTCH INTERLOCKING MECHANISM

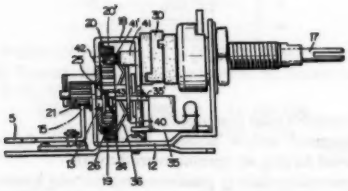
Yoshio Tanaka; Yasuhisa Nishikawa; Ryoichi Hasumi, all of Saitama, and Takashi Koizumi, Toda, all of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1980, Ser. No. 191,267

Claims priority, application Japan, Sep. 27, 1979, 54-132567[U]

Int. Cl.³ H03J *5/12*; G05G *1/02*

U.S. Cl. 74—10.33 **4 Claims**



1. In a pushbutton tuner having a plurality of manually operable tuning button slides, a memory slide coupled to said button slides to be moved a distance which varies according to the button slide selected for actuation, tuning means coupled to said memory slide for varying the tuning frequency of said tuner responsively to the displacement of said memory slide to effect a station tuning operation, a geartooth rack affixed to said memory slide, an output drive gear engaging said memory slide rack, a manually rotatable tuning shaft, rotary drive means coupling said drive gear to said tuning shaft, said rotary drive means including clutch means actuated by operation of any button slide from a normally engaged position which couples said tuning shaft to said drive gear to a disengaged position, the improvement comprising:

a support element;

a pivot pin rigidly affixed to said support element;

a support bracket carrying at least a portion of said rotary drive means, said portion including said drive gear and said clutch means, said support bracket having a hole therein for accepting passage of said pivot pin therethrough which pivotally supports said bracket, so that rotation of said support bracket in a first direction forces said drive gear into meshing engagement with said memory slide rack, said tuner further including resilient spring means connected between said support bracket and said support element for urging said support bracket in said first direction so as to keep said rack and said drive gear in meshing engagement; and

means for resiliently tensioning said support bracket against said pivot pin to force a portion of the wall defining said bracket hole against a portion of said pivot pin so as to eliminate looseness between said support bracket and said pivot pin.

4,532,819

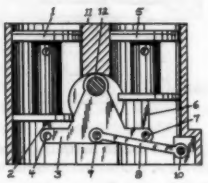
COMPACT CRANK DRIVE MECHANISM

M. Andrew Ross, 4195 Mumford Ct., Columbus, Ohio 43220

Filed Feb. 21, 1984, Ser. No. 581,683

Int. Cl.³ F16H *21/22*

U.S. Cl. 74—44 **6 Claims**



1. A crank drive mechanism for drivingly linking a crankshaft to two pistons which reciprocate along substantially parallel axes lying in a plane with a desired phase difference in two adjacent cylinders formed by cylinder walls of a housing, said mechanism comprising:

(a) A crankshaft journalled to said housing, the axis of said crankshaft being located between said cylinders, within the limits of reciprocation of at least one of said pistons, and transverse to the plane of the axes of said cylinders;

(b) A yoke with 4 pivot axes, said yoke rotatably attached to the throw of said crankshaft at a first one of said yoke pivot axes to define a circularly moving portion of the yoke;

(c) A pair of connecting rods, each rod pivotally connected at one end to said yoke at second and third yoke pivot axes, respectively, and pivotally connected at its opposite end to a different one of said two pistons; and

(d) A rocking lever pivotally attached at one end to said housing laterally of said yoke and pivotally attached to said yoke at a fourth yoke pivot axis;

wherein a portion of at least one cylinder wall is relieved and the circularly moving portion of the yoke passes through the relieved portion of the wall.

4,532,820

MOTION MULTIPLIER APPARATUS

Ralph D. Gerben, Glen Burnie, and Harry J. Walters, Fallston, both of Md., assignors to M. S. Willett, Inc., Cockeysville, Md.

Division of Ser. No. 919,591, Jun. 28, 1978, Pat. No. 4,256,218. This application Jul. 9, 1980, Ser. No. 167,284

Int. Cl.³ F16H *25/12, 21/44*

U.S. Cl. 74—56 **1 Claim**

1. Motion multiplier apparatus comprising

spaced parallel stationary rods,

parallel blocks mounted on the rods for axial movement with respect to the rods,

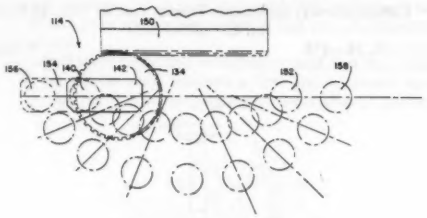
a toothed wheel rotatably mounted on one of the blocks

a stationary rack mounted parallel to the rods and engaging the toothed wheel,

an arm removably held in a radial notch in an end face of the toothed wheel and terminating radially outwardly beyond the toothed wheel in a follower positioned for movement within a transverse channel formed in the other of the blocks

said other of the blocks connected to a device for imparting movement to the device,

and cam means driveably connected to the block mounting the toothed wheel for imparting sufficient axial movement to said block to move said arm through about a 180° arc



from a first position substantially parallel to the rods to a second position substantially parallel to the rods,

said cam means comprising a barrel cam having an axial curve cam ridge on an outer surface, said ridge positioned between cam followers connected to the block mounting the toothed wheel.

4,532,821

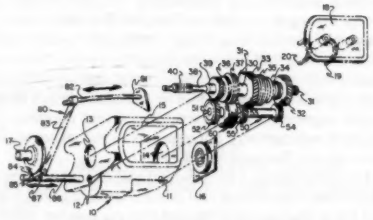
TRANSMISSION FOR RACING CARS

Thomas A. Hager, 410 Third St., W. Easton, Pa. 18042

Filed Oct. 21, 1983, Ser. No. 544,252

Int. Cl.³ F16H *3/08*

U.S. Cl. 74—370 **13 Claims**



1. In a modified manual synchronized transmission having a transmission drive shaft adapted to be operatively coupled to an engine, the improvement comprising:

(a) an output shaft on which is mounted at least one forward gear and which, as modified, contains at least one forward gear fewer than originally provided in an unmodified transmission of the same type;

(b) an abbreviated counter shaft, the axis of which is parallel to the axis of said output shaft;

(c) a stub shaft in co-axial alignment with said counter shaft, the adjacent ends of said counter shaft and said stub shaft being spaced apart;

(d) gear means for driving the stub shaft from the transmission drive shaft;

(e) a friction clutch mounted intermediate said stub shaft and said counter shaft, said clutch linking the adjacent ends of said two shafts to permit rotational linking thereof when said clutch is engaged, said clutch being normally biased in disengaged position—the total length of said abbreviated counter shaft, said stub shaft and said friction clutch approximating the length of the counter shaft provided in an unmodified transmission of the same type;

(f) at least one forward gear drive mounted on said abbreviated counter shaft which drive is the meshing companion of the forward gear on said output shaft;

(g) means for engaging said clutch by overcoming its normal bias;

(h) first synchronizer means for selectively rotationally linking said counter shaft and said output shaft via said forward gear and its companion forward gear drive, said means also including a neutral position;

(i) second synchronizer means for selectively rotationally linking the transmission drive shaft to said output shaft in direct drive, said means also including a disengaged position; and,

(j) a plurality of mechanically interlocked selector forks which control movement of said first and said second synchronizer means and permit selection of only predetermined gear orientations;

said modified transmission permitting a vehicle in which it is installed to move slowly forward when said first synchronizer means is in its forward position and said means for engaging said clutch is operated and, once forward motion has been established, permitting the direct linking of the transmission drive shaft and said output shaft to allow the vehicle to be driven forward at full speed.

4,532,822

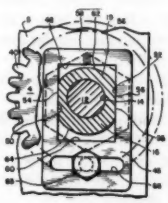
SHAFT AND GEAR ADJUSTER

Edward S. Godlewski, 129 S. Spruce, Wooddale, Ill. 60109

Filed Sep. 24, 1982, Ser. No. 422,872

Int. Cl.³ F16H *35/06, 35/08, 55/18, 57/00*

U.S. Cl. 74—397 **5 Claims**



1. An adjuster for meshing gears mounted on generally parallel shafts carried in cylindrical bearings extending through complementary cylindrical openings in a support plate, comprising:

an eccentric bore in at least one of said bearings through which one of said shafts is journaled,

means for rotating said one of said bearings to shift the associated shaft to position the gears in proper meshing relationship,

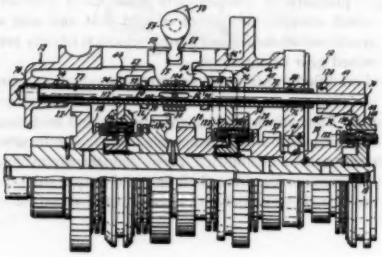
wherein said means for rotating comprises an elongated member having a first slot with essentially parallel side edges and said one of said bearings having diametrically opposite flat side edge portions extending chordally thereof in close fitting relation between the side edges of the slot and relatively slidable therewith as said member is rotated while restrained from rotary movement with respect to said one bearing, and wherein said member has a second slot elongated transversely of said side edges, and a securing means extending through said second slot for holding said member in secured rotatably displaced positions; said first slot being longer than the diameter of the bearing.

4,532,823

CONCENTRIC SHIFT RAIL MECHANISM

Syed T. Razzacki, Troy, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 6, 1983, Ser. No. 539,509
Int. Cl.[4] G05G 9/12
U.S. Cl. 74—473 R 3 Claims



1. In a manual gear selecting and shifting mechanism for a vehicle transmission change speed gearing including, a transmission casing, means for mounting a selector on said casing to control the selection of the desired speed gearing on a main gear shaft, a shifter rail assembly adapted to control the shifting movement of the speed gearing, said shifter rail assembly comprising;

a tubular member mounted on said casing for axial fore and aft sliding movement in the direction of its longitudinal axis;

a shift rod received within said tubular member for axial sliding movement relative thereto;

means fixedly mounting first operator means on said tubular member for movement therewith;

means mounting second operator means on said tubular member such that said second operator means is free to slide fore and aft relative to said tubular member;

each said first and second operator means respectively engaging an associated clutch sleeve;

a pair of diametrically opposed longitudinally extending control slots formed in said tubular member;

a control pin extending transversely through said shift rod and slidably engaged within each said control slot;

manual selector means operative for engaging said first operator means for axial reciprocal sliding movement of said first operator means and said tubular member fore and aft relative to said shift rod;

said control slots and pin enabling said tubular member to slide a predetermined distance fore or aft from its neutral position whereby said first operator means shifts its associated clutch sleeve into its respective fore or aft speed gear engaging position;

said manual selector means operative for engaging said second operator means for axial sliding such that said second operator means is free to slide axially relative to said tubular member a predetermined distance fore or aft of said cross pin neutral position whereby said second operator means shifts its associated clutch sleeve into its respective fore or aft gear engaging position; and

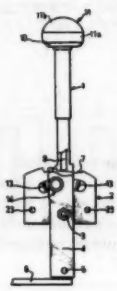
journal bearing means intermediate said tubular member and said shift rod such that said first operator means readily moves said gearing into its fore or aft gear engaging position thereby reducing manual gear shift operating effort.

4,532,824

AUTOMOBILE AUTOMATIC TRANSMISSION CONTROL DEVICE

Jean-Michel Lamy, Paris, and Joël Jacquet, Nanterre, both of France, assignors to Regie Nationale des Usines Renault, Paris, France

Filed Jan. 6, 1983, Ser. No. 456,295
Claims priority, application France, Jan. 6, 1982, 82 00108
Int. Cl.[3] G05G 5/14
U.S. Cl. 74—475 6 Claims



1. A vehicle automatic transmission control device comprising:

a sector fixed to said vehicle, said sector including a plurality of lockout notches on one edge thereof and a plurality of self-locking notches in the body thereof;

a control lever pivoted about an axis fixed to said sector, said lockout notches and self-locking notches being respectively arranged on first and second loci about said pivot axis, said control lever being connected to said transmission, wherein said first locus is further from said pivot axis than is said second locus and wherein said lockout notches and said self-locking notches lie substantially in a common radial segment, wherein a width of said common radial segment substantially corresponds in extent to widths of each of said first and second loci;

a rod movable along a longitudinal axis of said control lever and within a portion of said control lever, a portion of said rod being engageable with said lockout notches when said rod is in a first position;

a trigger release mounted on one end of said control lever;

a hand grip fixed to said control lever;

biasing means associated with said hand grip and said trigger release for biasing said rod into said first position; and

elastic self-locking elements mounted on said control lever at positions corresponding to said self-locking notches and engageable with said self-locking notches,

whereby coaction of said self-locking notches and said self-locking elements define pivot positions of said control lever corresponding to transmission selection positions, and whereby coaction of said lockout notches and said rod prevents unintentional pivoting of said lever.

4,532,825

CONTROL DEVICE FOR A TWO STAGE DERAILLEUR

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

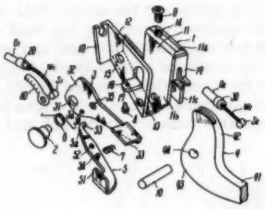
Filed Jun. 4, 1982, Ser. No. 385,126
Claims priority, application Japan, Jun. 15, 1981, 56-88520[U]
Int. Cl.[3] G05G 5/06; F16C 1/10
U.S. Cl. 74—532 8 Claims

1. A control device for controlling a two stage derailleur through a control wire, comprising:

a fixing member supporting a first lever shaft and a second lever shaft, the second lever shaft having an axis substan-

tially perpendicular to that of said first lever shaft, said fixing member having a fixing portion and a lever supporting portion, said lever supporting portion having a first supporting surface for supporting said first lever shaft and a support extending perpendicularly to said first supporting surface and having a second supporting surface for supporting said second lever shaft, so that said first lever shaft is supported to said first supporting surface and said second lever shaft is supported to said second supporting surface;

a control lever supported swingably to said first lever shaft, being displaceable between a first and a second speed change position corresponding to speed change positions



of said derailleur, and having a retaining means for retaining one end of said control wire;

a release lever supported swingably to said second lever shaft at said fixing member and displaceable at an utmost end thereof away from or toward said control lever;

a first biasing means for biasing said control lever always toward said first speed change position;

a second biasing means for biasing said release lever at an utmost end thereof always in the direction of approaching said control lever; and

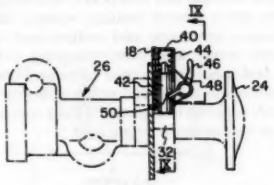
a holding means provided at said control lever and at the utmost end of said release lever for holding said control lever at said second speed change position against said first biasing means through said release lever.

4,532,826

BRAKE VALVE SAFETY DEVICE

James B. White, McClelland Rd., Box 45A1, Finleyville, Pa. 15332

Filed Apr. 20, 1983, Ser. No. 486,784
Int. Cl.³ G05G 1/10
U.S. Cl. 74—553 **6 Claims**



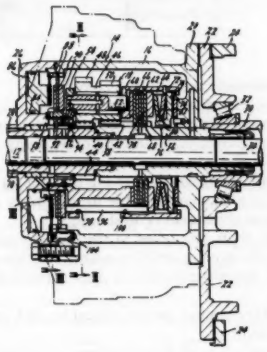
1. In a brake valve control device adapted to be secured to the dashboard of a motor vehicle and including a push-pull switch assembly having a body member for attachment to the dashboard, a stem extending through said body member, and a knob on said stem for moving the stem toi activate and deactivate the valve, the improvement in a safety device comprising releasable locking means on said body member, and engageable with said stem and knob for preventing release of the vehicle brakes by accidental movement of the valve stem and knob, said body member including a housing having a slidable pin therein, said pin being aligned with said stem and biased toward said stem and lever means on said housing and engaged with said pin for moving said pin against the bias, whereby when the stem of the switch assembly is pushed in the pin engages said knob, when the stem of the assembly is pulled out the pin extends under the force of the bias and engages the stem between the dashboard and the knob to prevent the stem from being pushed in, and when the lever means is operated to move said pin against the bias, the stem can be pushed in.

4,532,827

DUAL POWER TRANSMISSION FOR TRACTOR VEHICLES

Rudolf Beim, Southfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 21, 1983, Ser. No. 534,224
Int. Cl.³ F16H 3/02, 57/10
U.S. Cl. 74—745 **4 Claims**



1. In a dual power tractor driveline for delivering torque from an engine to traction wheels comprising a multiple ratio torque transmitting gear assembly and an auxiliary gear assembly located between the multiple ratio gear assembly and the engine, the auxiliary gear assembly comprising:

a first input shaft adapted to be connected to the engine, a first sun gear formed on said input shaft, an intermediate shaft disposed coaxially with respect to said input shaft;

a second input shaft for said multiple ratio gear assembly connected to one end of said intermediate shaft, a second sun gear formed on said intermediate shaft, compound planet pinions connected together for joint rotation and having two pinion portions of unequal pitch diameter, one pinion portion engaging the sun gear on said first input shaft and the other pinion portion engaging the sun gear on said intermediate shaft, a carrier rotatably supporting said pinions;

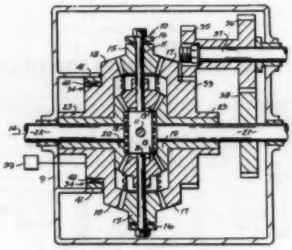
a casing surrounding said sun gear and pinions, a fluid pressure operated brake actuator in said casing on one end of said carrier, brake discs carried by said casing and by said carrier adjacent said brake actuator, a clutch drum connected to said carrier on the side of said carrier opposite said brake actuator, clutch discs carrier by said clutch drum and by said intermediate shaft, spring means within said clutch drum for engaging said clutch discs to establish normally a 1:1 driving ratio between said input shaft and said intermediate shaft;

actuator rods supported slidably by said carrier and extending from said clutch discs to said brake discs whereby said clutch discs are moved out of clutching engagement against the opposing force of said spring means when clutch pressure is applied to the said brake actuator.

4,532,828
KINEMATIC MECHANISM

Francesco LaGuardia, Lavorate Centro 4, Sarno, Italy (84080)

Continuation-in-part of Ser. No. 966,791, Dec. 6, 1978, abandoned, which is a continuation of Ser. No. 503,132, Sep. 16, 1974, abandoned. This application Jun. 8, 1981, Ser. No. 271,628
Claims priority, application Italy, Jan. 23, 1974, 64802 A/74
Int. Cl.³ F16H *57/10*
U.S. Cl. 74—793 **7 Claims**



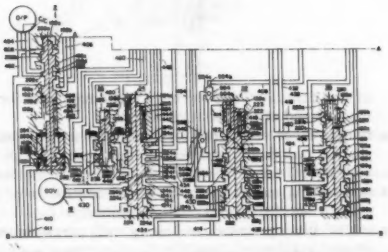
1. A kinematic mechanism, comprising:
a housing framework;
two crown plates having central hubs, one plate being a driven crown plate and the other being a driving crown plate;
a driving shaft journalled in the housing for rotation about a central axis, mounting the driving plate for free rotation thereon about said central axis;
a driven shaft journalled in the housing and axially spaced from the driving shaft for coaxial rotation with the driving shaft, mounting the driven plate thereon about said central axis;
a planetary conical pinion affixed to each shaft for rotation therewith;
said planetary conical pinions being mounted concentrically with the crown plates;
means supporting a group of radially extending cruciform axles perpendicular to the central axis and positioned axially between the crown plates and conical planetary pinions;
an outer set of satellite pinions mounted for free rotation on the cruciform axles, with each pinion of the outer set meshing with both crown plates;
an inner set of satellite pinions mounted for free rotation on the cruciform axles and spaced radially inward of the outer set, each pinion of the inner set meshing with both planetary conical pinions;
wherein said cruciform axles and satellite pinions form a cruciform reducer, effecting a double conical epicyclic train that will rotate in a plane perpendicular to the central axis and
rotary conditioning means interconnecting the driving shaft and the driving crown plate for rotating the driving shaft and the driving crown plate simultaneously and at different rotational speeds.

4,532,829
HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kazuhiko Sugano, Zama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jul. 29, 1983, Ser. No. 518,681
Int. Cl.³ B60K *41/10*
U.S. Cl. 74—869 **5 Claims**

4. A hydraulic control system for an automatic transmission including a plurality of fluid operated friction units including a first fluid operated friction unit and a second fluid operated friction unit, the first fluid operated friction unit being discharged when the second fluid operated friction unit is pressurized during a shift between two speed ratios, the hydraulic control system comprising:
means for generating fluid pressure to be supplied to the first and second fluid pressure operated friction units;
means for defining a conduit having one end communicating with the first fluid operated friction unit and an opposite end;
a first shift valve communicating with said opposite end of said conduit, said first shift valve communicating with said fluid pressure generating means and including means for selectively supplying the fluid pressure to said opposite end of said conduit;
a second shift valve communicating with said fluid pressure generating means and the second fluid operated friction unit for selectively supplying the fluid pressure to the second fluid operated friction unit, said second shift valve including means for selectively supplying the fluid pressure to the second fluid operated friction unit;
means for controlling rate of fluid discharge from the first fluid operated friction unit through said conduit during



the shift between the two speed ratios such that the fluid discharge from the first fluid operated friction unit is effected at a first predetermined rate when the fluid pressure supplied to the second fluid operated friction unit is lower than a predetermined value, and is effected at a second predetermined rate which is higher than said first predetermined rate when the fluid pressure supplied to the second friction unit exceeds said predetermined value, said fluid discharge rate controlling means including a timing valve including a valve bore having a first port connected with said opposite end of said conduit and a second port communicating with the second fluid operated friction unit, said timing valve having an orifice and a spool movable within said valve bore between a first position wherein said first port is discharged through said orifice and a second position wherein said first port is discharged bypassing said orifice, said spool having a pressure acting area communicating with said second port, said spool being urged to move from said first position thereof to the second position thereof when the fluid pressure supplied to the second fluid operated friction unit acts on said pressure acting area.

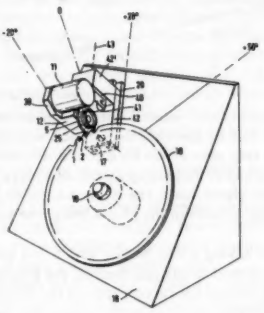
4,532,830
SAWTOOTH GRINDING MACHINE

Erwin H. Vollmer, Jahnstr. 4, D-7242 Dornhan, and Manfred Glatthaar, Ignaz-Rohr-Str. 24, D-7328 Hochmössingen, both of Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,671
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1983, 3303075
Int. Cl.³ B23D *63/12*
U.S. Cl. 76—45 **9 Claims**

1. Sawtooth grinding machine for grinding saw blade teeth, such as teeth with hard metal inserts, including a single grinding head pivotable about a plurality of axes and capable of translatory movement in a plurality of directions, said grinding

head arranged to grind both the face and back of a tooth, wherein the improvement comprises an axially extending spindle shaft, a first grinding wheel and a second grinding wheel each suitable for grinding hard metal and mounted on said spindle shaft said first and second grinding wheels being secured together and forming a composite wheel, said first grinding wheel is a disk wheel having a disk side and an oppositely facing backside, said disk side extends perpendicularly of the axis of said spindle shaft, said backside extends transversely of the axis of said spindle shaft and tapers toward said disk side at the radially outer circumference of said disk wheel so that said



disk wheel has a minimum thickness in the axial direction of said spindle shaft at the radially outer circumference thereof whereby said disk wheel can be inserted into a narrow tooth gap for grinding the face of a tooth, said disk side having an annular abrasion coating at the radially outer circumference thereof, and said second grinding wheel is a cup wheel for grinding the back of a tooth, the radially outer circumference of said cup wheel has a smaller diameter than the radially outer circumference of said disk wheel and said cup wheel has an abrasive ring located on the radially outer circumference thereof with said abrasive ring located in spaced relation from said disk wheel.

4,532,831

METHOD OF AND APPARATUS FOR OPENING CONTAINER LIDS

Arthur O. Ackerson, III, 33 Boulder Dr., Bay Point, Key West, Fla. 33040

Filed Sep. 5, 1984, Ser. No. 647,467
Int. Cl.³ B67B *7/22*
U.S. Cl. 81—3.43 **6 Claims**

1. Apparatus for opening containers, comprising:
a cord having a diameter which reduces as the cord is stretched and rebounds as the cord is released;
an elongated member formed with first and second longitudinal bores for receiving said cord; and first and second longitudinal bores being parallel to each other and offset from the center of said elongated member;
a portion of said cord forming a loop at one end of said elongated member with the ends of the cord extending respectively through the first and second bores;
one end of said cord anchored to said elongated member; the opposite end of said cord extending through said elongated member and a gripper and forming a free end; and
said gripper being attached to said elongated member;
said gripper further being formed with a notch for receiving the free end of said cord.

4,532,832

DUAL-MODE RATCHET WRENCH

Wendell N. Christensen, 1304 Avondale Rd., Everett, Wash. 98204

Filed Oct. 3, 1983, Ser. No. 538,134
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.29 **4 Claims**

1. A dual-mode ratchet wrench, comprising:
a wrench body, said wrench body having a head portion and a handle portion extending from said head portion, said head portion having first and second surfaces that are spaced from and substantially parallel to one another, said head portion including an aperture passing between said first and second surfaces, said aperture being generally cylindrical and having an axial centerline passing therethrough, the inner surface of said aperture including a circumferential row of gear teeth that extend substantially parallel to said axial centerline of said aperture, said head portion having a circumferential shoulder located within said aperture intermediate said first surface and said circumferential row of gear teeth, said head portion including a cavity that opens onto said second surface and is connected to said aperture, said handle portion having a cylindrical bore extending axially therethrough with said bore intersecting said cavity;
a drive unit, said drive unit having a first end and a second end, said drive unit being retained in said aperture of said head portion of said wrench with said first end of said drive unit positioned next to said first surface of said head portion, said first end of said drive unit having a circumferential projection positioned in juxtaposition with said shoulder of said aperture, said second end of said drive unit including a drive lug extending beyond said second surface of said head portion, said drive unit being rotatable about said axial centerline through said aperture, said drive unit having a recess in the first end of said drive unit and a slot connecting said recess to the outer surface of said drive unit;
a gear member, said gear member being affixed to said drive unit intermediate the first and second ends of said drive unit, said gear member having a bevel gear formed thereon;
ratchet means for determining the direction of rotation of said drive unit relative to said wrench body, said ratchet means including a spring-biased pawl pivotally mounted within said slot in said drive unit for projection through said slot and engagement with said circumferential row of gear teeth in said aperture;
a drive shaft, said drive shaft received by and extending coaxially along said cylindrical bore of said handle portion, said drive shaft having a first end and a second end and having a length greater than said handle portion, said drive shaft being rotatable in said bore about the axial centerline of said bore, said drive shaft being movable

axially within said bore between an engaged position wherein said first end of said shaft is positioned toward said aperture in said head portion and a disengaged position wherein said first end of said shaft is positioned away from said aperture;

a sleeve, said sleeve circumferentially surrounding the distal portion of said handle portion of said wrench and slidable therealong, said sleeve being connected to said second end of said drive shaft for both rotation and axial translation therewith;

a pinion, said pinion located on said first end of said drive shaft, said pinion configured for engagement with said gear member, said pinion being configured and arranged for axial and rotational movement with said drive shaft; and,

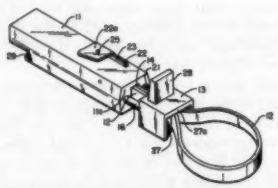
a detent mechanism, said detent mechanism including a spring-biased detent ball protruding from a wall of said cavity and a circumferential detent ridge formed on the surface of said pinion, said detent ridge being configured for movement past said detent ball as said drive shaft is moved between said engaged and said disengaged positions, said detent mechanism operable to retain said drive shaft in either said engaged or said disengaged positions by means of said detent ball abutting said detent ridge, said spring-biased detent ball being positioned to urge said pinion against said gear member when said drive shaft is in the engaged position.

4,532,833

STRAP-TYPE WRENCH FOR REMOVING ROTATABLE CLOSURES OR SIMILAR MEMBERS

Edgar S. Downs, P.O. Box 242, Worthington, Ohio 43085

Filed Jan. 24, 1984, Ser. No. 573,332
Int. Cl.³ B25B *13/52*
U.S. Cl. 81—64 **4 Claims**



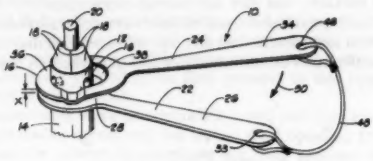
1. A wrench comprising an elongated handle with opposed ends, a flexible strip having ends which are overlapped to form a loop, means for anchoring the overlapped ends within the handle at an anchoring point longitudinally thereof with the loop extending outwardly from one end of the handle, a loop-adjusting slide member mounted on the handle at said end for slideable movement in and out relative thereto, said flexible member passing through the slide member into a central socket extending longitudinally from said end of the handle to said anchor point, said slide member being carried by a pair of parallel rods slideably mounted in sockets extending into the handle from said end and being parallel to each other and to the central socket, one of said rods having ratchet teeth formed thereon, a ratchet pawl pivotally mounted on said handle intermediate its length and extending into the socket for said ratchet rod into engagement with the teeth thereof for holding the slide in an outward position when it is moved outwardly of said end of the handle from loop-expanding position into loop-tightening position, a spring acting on the pawl to engage the ratchet teeth, and a spring in the socket of the other rod acting on it to return it to loop-expanding position upon release of the ratchet rod by the pawl.

4,532,834

TWO-PIECE DRILL CHUCK WRENCH

Clyde H. Hartman, R.R. #1, Newton, Kans. 67114

Filed Feb. 5, 1982, Ser. No. 346,003
Int. Cl.³ B25B *13/00*
U.S. Cl. 81—16 **3 Claims**



1. A two-piece chuck wrench for receipt around a chuck body of a drill tool or the like, the wrench engaging beveled gear teeth of a ring gear around a top of a rotatably mounted chuck operating sleeve and engaging one of a plurality of bores in the side of the chuck body, the wrench loosening and tightening tool-engaging jaws in the chuck body, the wrench comprising:

a lower piece having a first handle with a first circular head integrally formed in one end thereof, the first head having an opening therein for receipt around the chuck body, the first head having beveled teeth around the opening and adapted for engaging all of the beveled gear teeth of the ring gear; and

an upper piece having a second handle with a second circular head integrally formed in one end thereof, the second head having an opening therein for receipt around the chuck body, the second head having a pin extending radially inward from the inner circumference of the second head, the pin adapted for receipt in one of the bore holes;

the bottom of the second head of the upper piece rests on the top of the first head of the lower piece and pivots thereon when loosening and tightening the tool engaging jaws; and

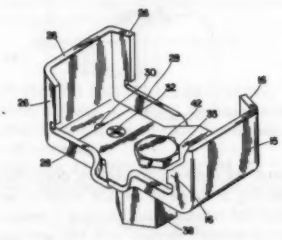
wherein opposite sides of the second head of the upper piece are tapered downwardly so the upper piece rests in a spaced relationship above the lower piece when loosening and tightening the tool engaging jaw.

4,532,835

BI-DIRECTIONAL FILTER WRENCH

Brian M. Schwitters, Clara City, Minn., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed May 7, 1984, Ser. No. 607,540
Int. Cl.³ B25B *13/18*
U.S. Cl. 81—128 **7 Claims**



1. A universal oil filter wrench for installing and removing filter cartridges from limited access locations in automobiles and the like, comprising:

an upper sheet metal stamping of generally rectangular configuration having a flat base portion and an upturned end,

a first pair of flanges at the sides of said upturned end on said upper stamping,

a lower sheet metal stamping of generally rectangular configuration having a flat base portion and an upturned end,

a second pair of flanges at the sides of said upturned end on said lower stamping, said first and second pairs of flanges being lateral edge portions of said upturned ends bent backwardly toward said respective base portions and flared outwardly of said upturned ends,

a pair of slots in said base portion, said slots being elongated in the direction of said upturned end,

a pair of fasteners in said slots interconnecting said upper and lower stampings for limited linear relative sliding movement over one another thereby allowing movement of said upturned ends toward and away from one another to move said pairs of flanges in a line toward one another for engagement with the generally cylindrical peripheral surface of an oil filter cartridge,

a circular opening in said lower stamping intermediate said pair of slots,

a further slot in said upper stamping elongated in a transverse direction and overlying said circular opening,

a nut having a cylindrical peripheral portion rotatably disposed in said circular opening, and

a cam member eccentrically located on said nut for rotation therewith and extending into said transverse slot for moving said upper stamping outwardly and inwardly relative to said lower stamping upon both clockwise and counterclockwise rotation of said nut.

4,532,836

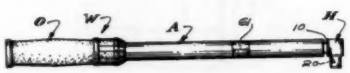
ADJUSTABLE FULCRUM FOR TORQUE WRENCHES

Bosko Grabovac, Arcadia, Calif., assignor to Consolidated Devices, Inc., City of Industry, Calif.

Filed Jul. 25, 1983, Ser. No. 516,778

Int. Cl.³ B25B *23/14*

U.S. Cl. 81—483 **6 Claims**



1. An adjustable click-type torque wrench structure comprising an elongate, manually engageable tubular arm with a cylindrical interior surface and front and rear ends, an elongate, work-engaging head at the front end of the arm on an axis normal to the axis of the arm, an elongate lever projecting rearwardly from the head and freely into the arm, a first pivot means pivotally connecting the front end portion of the lever to the front end portion of the arm on an axis spaced rearward from and parallel with the axis of the head, an elongate link with front and rear ends positioned freely within the arm, a second pivot means pivotally connecting the front end of the link to the rear end of the lever on an axis parallel with the first pivot means, a rearwardly disposed front cam seat at the rear end of the link, an elongate annular fulcrum block engaged about the link between the ends thereof and shiftable circumferentially and longitudinally relative thereto and having a substantially radially outwardly disposed annular bearing surface with oppositely outwardly disposed work load transmitting sides slidably and pivotally engaging opposing sides of the interior surface of the arm on the central longitudinal radial planes of the link and arm which are normal to the axes of said pins, the radial plane of the annular bearing surface is angularly offset from normal to the central axis of the link at an angle of about 5°, lock means releasably locking the block in set longitudinal and circumferential position on the link, an elongate plunger with front and rear ends in the arm spaced rearward from the link and having a forwardly disposed rear cam seat, a cam block with cam faces normally in bearing engagement with the front and rear cam seats and spring means in the arm rearward of the plunger and yieldingly urging the plunger forward and holding the plunger, cam block and link in pressure engagement with each other; the position of said opposite work load transmitting sides of the annular bearing surface are moved longitudinally in opposite directions relative to the link, arm and to each other by circumferential movement of the block on the link and within the arm.

4,532,837

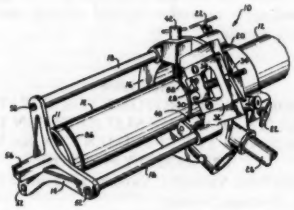
NIPPLE GROOVING DEVICE

Terry E. Cushenbery, 700 West Fourth, Kingman, Kans. 67068, and Jeffrey A. Bryant, 315 West First, Udall, Kans. 67146

Filed Sep. 13, 1982, Ser. No. 417,670

Int. Cl.³ B23B *3/22, 5/04;* B21B *3/06;* B26D *3/06*

U.S. Cl. 82—4 C **10 Claims**



1. For use with a pipe groover having an operable cutting member adapted for movement about pipe stock and means for moving said cutting member about said pipe stock for scoring first and second annular grooves about said pipe stock to form a pipe nipple on said stock having first and second annular seats thereon, the improvement comprising:

a stop member for contacting one end of said pipe stock;

fastener means releasably connecting said stop member to said groover in a first longitudinally-spaced apart relationship therebetween, said contact of said stop member positioning said groover at a first longitudinal displacement along the extent of said pipe stock relative to said same one end of said pipe stock for scoring said first annular groove about said pipe stock upon operation of said moving means and said cutting member; and

a first extension means releasably engageable with said fastener means and said groover and including at least one spacer pin having first and second longitudinally spaced-apart ends, said spacer pin having first means at said first end releasably engaging said fastener means upon release of said fastener means connection from said groover and second means at said second end releasably engaging said groover, said engagement of said spacer pin with said fastener means and said groover displacing said stop member from said groover in a second longitudinally-spaced apart relationship greater than said first spaced relationship whereupon said stop member contact of said same one end of said pipe positions said groover and said cutting member at a second greater longitudinal displacement along the extent of said pipe stock relative to said same one end of said pipe stock for scoring said second annular groove about said pipe stock upon operation of said moving means and said cutting member whereby to form said pipe nipple on said pipe stock with said seats corresponding to said grooves.

9. For use with a pipe groover having an operable cutting member and means for moving said cutting member about pipe stock having first and second ends for scoring annular grooves about said pipe stock to form a pipe-connecting nipple having first and second annular seats thereon corresponding to said grooves, the improvement comprising:

a separable stop member for contacting one end of said pipe stock;

fastener means releasably connecting said stop member to said groover in a first longitudinally-spaced relationship therebetween, said contact of said stop member positioning said groover and said cutting member at a first longitudinal displacement along the extent of said pipe stock relative to said one end of said pipe stock for scoring a first annular groove therearound upon operation of said cutting member; and

extension means releasably interposed between said fastener means and said groover, said interposed extension means further displacing said stop member from said groover in a second longitudinally-spaced relationship therebetween greater than said first spaced relationship whereupon said stop member contact of said same one end of said pipe positions said groover and said cutting member at a second greater longitudinal displacement along the extent of said pipe stock as measured from said same one end of said pipe stock for scoring a second annular groove therearound upon operation of said moving means and said cutting member.

4,532,838

METHOD IN A MICROTOME FOR CREATING THE POSSIBILITY THAT THE SLIT BETWEEN THE KNIFE EDGE AND THE SPECIMEN CAN BE MADE EXTREMELY NARROW

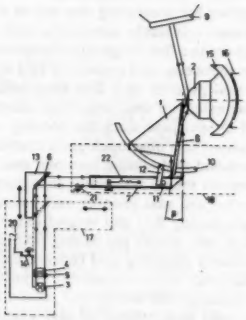
Anton Söderkvist, Vällingby, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Filed Jun. 17, 1983, Ser. No. 505,200

Claims priority, application Switzerland, Jun. 28, 1982, 8203967

Int. Cl.³ G01N *1/06*

U.S. Cl. 83—13 **6 Claims**



1. A method for cutting sections from a specimen using a microtome, said microtome comprising:

a specimen holder;

a knife having a knife edge, said knife being turnable about said knife edge as an axis, said knife having a front surface facing said specimen holder;

drive means for moving said specimen holder and said knife edge toward one another, and for moving said specimen holder downwardly relative to said knife edge;

a light waveguide having one end disposed below said knife edge and arranged to direct light passing therethrough on to a portion of said front face of said knife adjacent said knife edge, said one end of said light waveguide being arranged to turn with said knife about said knife edge as axis; and

a light source for supplying light to the opposed end of said light waveguide, said light source being arranged to move with said opposed end of said light waveguide as said light waveguide is turned about said knife edge as axis,

said method comprising:

mounting said specimen in said specimen holder;

bringing said knife edge adjacent said specimen mounted in said specimen holder, thereby forming a slit between said knife edge and said specimen;

passing light from said light source through said light waveguide, thereby causing said light to impinge upon said front face of said knife, and at least part of said impinging light to be reflected from said front face of said knife on to said specimen, thereby forming on said specimen an illuminated area which, when viewed from a point lying above said knife edge and on the opposed side of the vertical plane containing the knife edge from the specimen holder, has a breadth proportional to the width of the slit;

bringing said knife edge and said mounted specimen closer together, thereby reducing the width of said slit, while observing said illuminated area from said point to ensure that said knife edge does not contact said mounted specimen; and

activating said drive means, thereby moving said specimen holder and said knife edge toward one another, and moving said specimen holder downwardly relative to said knife edge, and causing said knife to cut sections from said mounted specimen.

4,532,839

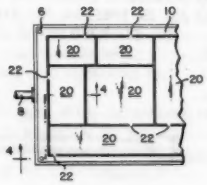
METHOD FOR SIMULTANEOUSLY CUTTING A PLURALITY OF CIRCUIT BOARDS

Thomas C. Easton, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 21, 1983, Ser. No. 564,817

Int. Cl.³ B26D *7/01*

U.S. Cl. 83—29 **7 Claims**



1. A method of cutting circuit boards comprising the steps of:

placing a stack of panels of board material upon locating pins;

cutting the major portion of the peripheral outline of a plurality of circuit boards leaving a tab on each board;

placing an impermeable sheet over the stack of panels;

applying a vacuum to the underside of the stack;

cutting the tabs;

removing the circuit boards.

4,532,840

SLICING MACHINE HAVING MEANS TO DETERMINE IF SUFFICIENT PRODUCT REMAINS TO CUT A WHOLE SLICE

Peter Antonissen, Norfolk, England, assignor to Thurne Engineering Company Limited, Norfolk, England

Filed May 29, 1984, Ser. No. 614,430

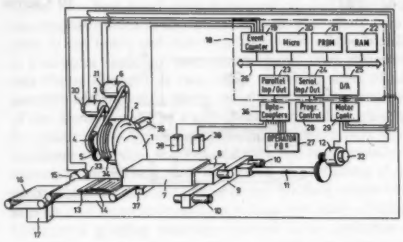
Claims priority, application United Kingdom, May 27, 1983, 8314766

Int. Cl.³ B26D *5/20*

U.S. Cl. 83—71 **9 Claims**

1. A slicing machine including a rotating blade adapted to cut slices from a product to be sliced, a feed head engaging said

product, feeding means driving said feed head whereby said feed head urges said product towards said blade, a position detector to detect when said feed head is a predetermined distance from said blade, an encoder associated with said feeding means to monitor movement of said feed head over said predetermined distance, monitoring means to monitor cutting



movement of said blade, and determining means responsive to said encoder and said monitoring means to determine when there is insufficient movement of said feed head remaining to allow another whole slice of product to be cut before said feed head reaches the end of its stroke, and to return said feed head to its starting position after completion of slicing of the last whole slice of said product.

4,532,841

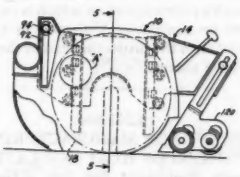
SAW BLADE GUARD

James L. Stackhouse, Jr., St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 356,321, Mar. 10, 1982, abandoned. This application Jun. 18, 1984, Ser. No. 597,997

Int. Cl.³ B26D *1/14*

U.S. Cl. 83—102.1 **3 Claims**



1. A guard assembly for a radial arm saw having a circular saw blade mounted on a horizontal shaft and a support therefor suspending the saw blade above a horizontal worktable comprising: a guard support frame mounted on said saw blade support, a one piece hood-like guard for extension over said entire saw blade, means mounting said guard for guided vertical movement on said frame and said means being constructed and arranged to permit said guard to fall freely to a downward position wherein it extends over said entire saw blade and permits free removal of said guard upward from said frame, said guard comprising front and rear vertical walls spaced from opposite faces of said saw blade, said walls having top, side and bottom edges and joining top and sidewalls, the lower portions of said side edges at both sides of said walls extending inward to said bottom edges, said joining sidewall at one side of said guard extending substantially to said bottom edges, the lower portions of said front and rear walls and said joining sidewall at one side of said guard being offset outward sufficiently to clear said saw blade, and the lower end of said joining sidewall at the other side of said guard being spaced upward from said bottom edges sufficiently to clear said saw blade whereby a lower portion of said guard at said other side is open, and a spreader and an anti-kickback device mounted for vertical adjustment on said frame and positionable to block approach to said saw blade through said other open lower side.

4,532,842

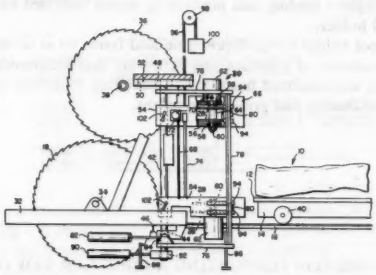
TILTABLE EDGER SAW MECHANISM

Arthur M. G. McFarlane, 1873 Redman Rd., Hamlin, N.Y. 14464

Filed Sep. 29, 1982, Ser. No. 428,285

Int. Cl.³ B27B *7/02*

U.S. Cl. 83—404.1 **19 Claims**



1. In a saw mill including means for moving a log along a first line past a series of saws for cutting said log into boards; an edger saw mechanism comprising:

a shaft;

an edger saw mounted on said shaft for rotation about an axis;

means for mounting said edger saw for tiltable and rotational movement;

means supporting said mounting means for axial movement while sawing; and

means for tilting said mounting means in a plane substantially parallel to said first line between a first position in which said edger saw is positioned to saw a board along one line, and a second position in which said edger saw is positioned to saw a board along a different line at an angle to said first line whereby the board area obtained from the log is increased.

4,532,843

PUNCH PRESS

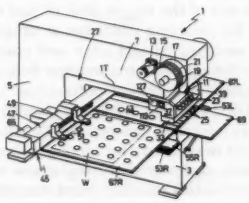
Hidetoshi Miyama, Hadano, Japan, assignor to Amada Company, Limited, Japan

Filed Nov. 2, 1983, Ser. No. 547,951

Claims priority, application Japan, Nov. 2, 1982, 57-165715[U]; Nov. 2, 1982, 57-165716[U]; Nov. 4, 1982, 57-166198[U]

Int. Cl.³ B21D *28/02*

U.S. Cl. 83—409 **10 Claims**



1. A punch press comprising:

a frame having an overhead beam and a base portion;

a vertically movable ram mounted at a front end of the overhead beam;

a tool holder having upper and lower arms and being disposed on the base portion of the frame with a gap between the tool holder and the overhead beam;

a plurality of upper punching tools disposed at a front end of the upper arm of the tool holder;

a plurality of lower tools corresponding to the upper tools disposed at a front end of the lower arm of the tool holder;

a striker mounted on the ram so as to hit each of the upper punching tools; and

a workpiece feeding and positioning means disposed on said tool holder;

said tool holder being disposed on said frame so as to reduce the amount of vibration and deflection that are transferred from the overhead beam to the punching tools and workpiece feeding and positioning means.

4,532,844

DEVICE FOR SUPPORTING A CIRCULAR SAW OF SAWING MACHINE

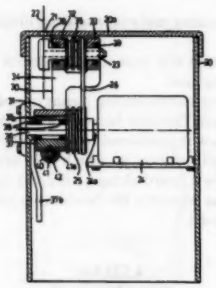
Jen W. Chang, and Hong-Tswen Chang, both of No. 68, Chung Cheng Rd., Fong Yuan City, Taichung Hsien, Taiwan

Filed Apr. 13, 1984, Ser. No. 600,262

Claims priority, application Taiwan, Sep. 16, 1983, 7226359

Int. Cl.³ B27B *5/24, 5/30*

U.S. Cl. 83—477.1 **2 Claims**



1. In a circular sawing machine of the type having a circular saw mounted on an arbor below a worktable for rotation about a first horizontal axis and a motor for driving the arbor having a driving pulley mounted on its horizontal output shaft and a transmission belt passing over said driving pulley, a device for supporting said circular saw comprising: a rotary eccentric member rotatably mounted on a second axis which is in alignment with the axis of the output shaft of said motor; a body having means for mounting said arbor at its upper portion, a driven pulley mounted on said arbor and connected to said driving pulley through said transmission belt, and a hollow cylindrical member at its lower portion and having its axis parallel to said first axis, said cylindrical member being sleeved onto said rotary eccentric member; a hydraulically operated means connected to said body for turning it about said second axis so as to raise or lower said circular saw relative to the worktable; a lever means attached to said eccentric member for rotating it relative to said hollow cylindrical member so as to adjust the distance of the axis of said arbor from the axis of said output shaft; and means for releasably locking said eccentric member.

4,532,845

TURRET PUNCH PRESSES

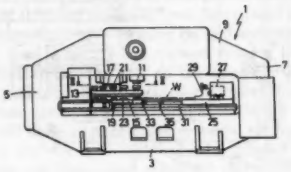
Katsumi Jinnouchi, Hatano, Japan, assignor to Amada Company, Limited, Japan

Filed Oct. 19, 1982, Ser. No. 435,317

Claims priority, application Japan, Oct. 20, 1981, 56-166451; Sep. 11, 1982, 57-137939[U]

Int. Cl.³ B26D *5/02*

U.S. Cl. 83—552 **10 Claims**



1. A turret punch press, comprising:

a rotatable upper turret;

a rotatable lower turret connected with the rotatable upper turret;

a plurality of upper tools held in the rotatable upper turret;

a plurality of lower tools, held in the rotatable lower turret, for coaction with the plurality of upper tools;

one drive means for rotating at least one tool in the upper turret and at least one tool in the lower turret;

means connected to the driving means for transmitting power to the plurality of upper and lower tools; and

means arranged between the transmitting means and the plurality of upper and lower tools for connecting and disconnecting the transmitting means and the plurality of upper and lower tools;

said connecting and disconnecting means each have a projecting end with a concavity which is radially inwardly tapered to be somewhat V-shaped in cross-section; and

rotating means connected to the one tools having a projecting end with a pointed portion which is radially outwardly tapered to be somewhat V-shaped in cross-section for engagement with the projecting end of the connecting and disconnecting means.

4,532,846

ARRANGEMENT FOR MANUFACTURING CURVED WALL PORTIONS OF HEAT INSULATING WALLS

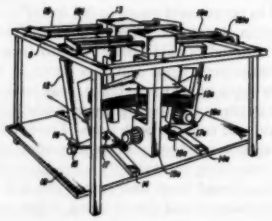
Gerhardt Schmalz, Biedenkopf, Fed. Rep. of Germany, assignor to Wezel GmbH & Co KG, Biedenkopf, Fed. Rep. of Germany

Division of Ser. No. 277,216, Jun. 25, 1981,. This application Mar. 9, 1984, Ser. No. 587,940

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040694

Int. Cl.³ B26D *1/50*

U.S. Cl. 83—796 **3 Claims**



1. An arrangement for manufacturing curved wall portions of a heat insulating wall for a container with a curved surface, the heat insulating wall having a heat-insulating layer of syn-

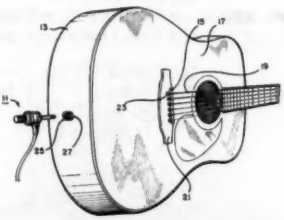
thetic foam material and a baffle layer associated therewith, the arrangement comprising a unit for cutting the curved blank coated with a baffle layer along joining surfaces so as to produce a wall portion with final dimensions, said unit being arranged for cutting the blank shaped as a circular segment and including a four-cornered frame element supported on upright posts at its corners, a four-sided table member arranged in a lower region between said posts and supporting the curved blank, two first band saws arranged on said table element at two opposite sides of the latter and movable along two circular lines to cut inner and outer circular sides of the blank formed as a circular segment, two second band saws suspended from said frame element at two other opposite sides of said table member and movable along radial lines so as to cut radial sides of the blank formed as a circular segment, first guiding means for guiding said first band saws and including two first guiding members curved in accordance with the two circular lines and movably supporting said first band saws during their movement along the circular lines, second guiding means for guiding said second band saws and including two pairs of substantially horizontal guiding members curved in accordance with the radial lines and each movably suspending a respective one of said second band saws during their movement along said radial lines, first means for inclining each of said first band saws about an axis parallel to their cutting direction between a plurality of first inclined positions and fixing the same in each of said first inclined positions, and second inclining means for inclining one said guiding member of each pair of said second guiding members relative to the other second guiding member of the same pair of said second guiding member between a plurality of second inclined positions and fixing the same in each of said second inclined positions.

4,532,847

CONTROL ACCESSORY FOR AN ACOUSTICAL GUITAR

Paul E. Youngblood, 361-A S. Riverside Dr., Fort Worth, Tex. 76104

Filed Sep. 6, 1983, Ser. No. 529,837
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.16 **4 Claims**



1. A control accessory for a standard acoustical guitar which has been adapted to receive an electrical pickup, the pickup being mounted at the guitar saddle and being electrically wired to a female jack portion which protrudes from the button hole on the body of the guitar, the improvement comprising:

a male input jack having a jack case with a male portion extending therefrom which is engageable with said female jack portion on said guitar body;

an electrical cord running from said jack for electrically connecting said guitar pickup through said male and female jack portions to a power amplifier;

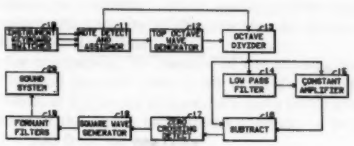
a volume control located on said male input jack for controlling the flow of electricity from said guitar pickup to said power amplifier to control the volume of said guitar, and wherein said volume control includes a pontentiometer located within said input jack case, said potentiometer having a control shaft which extends from said case and which is adapted to receive a control knob, said potentiometer being electrically wired between said electrical cord and said male input jack so that turning said control knob varies the electrical resistance of said control accessory to thereby control the volume of said guitar.

4,532,848

GENERATION OF MUTATION PITCHES IN AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Jan. 9, 1984, Ser. No. 569,134
Int. Cl.³ G10H *5/07*
U.S. Cl. 84—1.19 **11 Claims**



7. In combination with an electronic musical instrument having a keyboard array of keyswitches, apparatus for producing musical tones at mutation pitches comprising;

a keyswitch state detect means wherein a detect signal is generated in response to each actuated keyswitch in said keyboard array of keyswitches,

a plurality of tone generators each of which generates a musical waveshape at a frequency determined by an associated assignment signal,

an assignment means responsive to each said detect signal whereby said associated assignment signal is generated,

a plurality of harmonic suppression means each of which is associated with a corresponding one of said plurality of tone generators whereby selected harmonics of said generated musical waveshape are attenuated to produce a suppressed wave signal,

a plurality of waveshape means each of which is associated with a corresponding one of said plurality of harmonic suppression means and responsive to a corresponding one of said suppressed wave signal wherein a rectangular waveshape signal is generated at a frequency which is a multiple of the frequency of said musical waveshape generated by the corresponding one of said plurality of tone generators, and

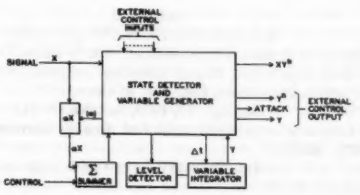
a tone production means responsive to said rectangular waveshape signal whereby said musical tone at a mutation pitch is produced.

4,532,849

SIGNAL SHAPE CONTROLLER

Dennis M. Drew, 35 Indiana St., Rochester, N.Y. 14609

Filed Dec. 15, 1983, Ser. No. 561,686
Int. Cl.³ G10H *1/057*
U.S. Cl. 84—1.22 **27 Claims**



1. A signal envelope shaper comprising:

a. means for producing an electronic signal X to be shaped;

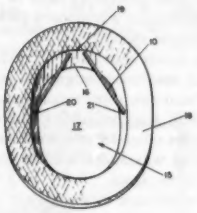
b. means for producing an electronic control signal Y for controlling the shape of signal X;
c. means for exponentially modifying said control signal Y and for multiplying said signal X by said exponentially modified control signal Y to form an output signal having the envelope shape XY^n;
d. means for providing exponent n with at least one value less than 1 and at least one value greater than 1; and
e. means for selecting a value of said exponent n in response to a state of said control signal Y so that said exponent n has different values in different regions of the envelope of said output signal XY^n.

4,532,850

MUSICAL RESILIENT BAND NOVELTY DEVICE

Engelbert J. Peham, St. Paul, Minn., assignor to Peham Plastics, Inc., St. Paul, Minn.

Filed Jul. 21, 1983, Ser. No. 515,651
Int. Cl.³ G10D *1/00*
U.S. Cl. 84—173 **11 Claims**



1. As a novelty device:
a resilient band characterized by producing a melodic tone when plucked while in a stretched condition;
means for anchoring said band;
spaced-apart means on said band for attaching said band to said anchoring means in a stretched condition; and
visible markings on said band located between said attaching means for designating locations on the band for pinching the band to produce melodic tones when plucked while anchored in a stretched condition.

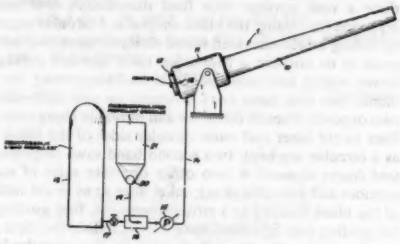
4,532,851

LIQUID-PROPELLANT SYSTEM

Karlheinz Reinelt, Hermannsburg, and Wolfram Witt, Düsseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 13, 1979, Ser. No. 31,112
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817507
Int. Cl.³ F41F *1/00*; C06D *5/00*
U.S. Cl. 89—7 **10 Claims**

1. A method of operating a barrel-type weapon comprising the steps of:
feeding to a gasification chamber of said weapon a non-hypergolic liquid propellant and gasifying said propellant in said chamber to drive a projectile from the barrel of said weapon; and



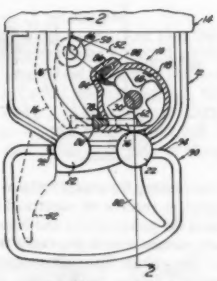
adding to said liquid propellant a dibasic propellant in the form of a spheroidal powder prior to introduction of the liquid propellant into said chamber.

4,532,852

RAPID FIRE ATTACHMENT FOR SEMI-AUTOMATIC FIREARMS

Richard O. Hance, 236 Evergreen Rd., and Gerald M. Hansen, Rte. 2, Box 428, both of North Fort Myers, Fla. 33903

Filed Jul. 25, 1983, Ser. No. 516,556
Int. Cl.³ F41C *19/00*
U.S. Cl. 89—136 **30 Claims**



1. An apparatus for burst firing of a semi-automatic firearm, said firearm having a trigger enclosed within a trigger guard and said apparatus comprising a housing, clamp means for releasably attaching said housing within said trigger guard, rotor means rotatably supported in said housing, reciprocable striker means projecting at one end from said housing and being operable by said rotor means for actuating said firearm trigger upon rotation of said rotor means, lever means pivotably attached to said housing, said lever means having an end in the form of a trigger, and means coupling said lever means to said rotor means for driving said rotor means in rotation, and a secondary trigger guard disposed around said lever.

4,532,853
FLUID-POWERED ACTUATORS

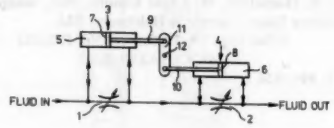
James E. Stangroom, Castleton, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 8, 1980, Ser. No. 193,491

Claims priority, application United Kingdom, Oct. 24, 1979, 7936927

Int. Cl.³ F01B *5/00*

U.S. Cl. 91—165 **9 Claims**



1. A fluid powered actuator including:

at least one pair of flow restrictors, at least one restrictor of the pair being variable, arranged for series flow connection in a fluid circuit;

a fluid pressure transmitting means arranged for parallel flow connection with each flow restrictor, having a linearly movable transmitting member responsive to the differential fluid pressure developed in use across the restrictor, the two transmitting members respective to each restrictor pair being mutually disposed for movement tangential to a common axis; and

an output member rotatable about each common axis, opposingly coupled to the two respective transmitting members so as to be angularly deflected by differential movement of the said two members.

4,532,854
SELECTIVELY OPERATIVE MULTI-DISPLACEMENT PUMP OR MOTOR

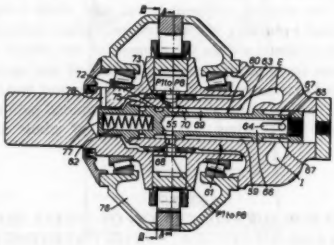
Kenneth W. S. Foster, Cheshire, England, assignor to Renold Plc, A British Company of Renold House, Manchester, England

Filed Dec. 20, 1983, Ser. No. 563,659

Claims priority, application United Kingdom, Dec. 24, 1982, 8236792

Int. Cl.³ F01B *13/06*

U.S. Cl. 91—472 **16 Claims**



1. In a hydraulic piston and cylinder machine comprising a plurality of pistons and cylinders, a ring of ports for alternatively supplying working fluid into, and for allowing said fluid to be discharged from each cylinder, and a cam having a plurality of lobes to control the displacement of the pistons in a cylinder block with respect to relative progression of the cylinder block along the direction of the cam and in which each of the pistons traverses each of the cam lobes during a full rotation of the machine to undergo a number of piston strokes equal to the number of lobes, the improvement comprising:

valve means adjustable to route working fluid discharged through at least one of a number of fluid discharge ports of the machine cylinders to an exhaust fluid outlet of the machine during each full rotation of the machine, the discharge fluid being conducted to said exhaust fluid outlet through an isolated pressure zone of the machine;

said valve means including a displaceable valve element having passageways forming a part of said isolated pressure zone;

said isolated pressure zone also including, at any given time, the cylinders associated with at least one pair of pistons of the machine which pistons and cylinders discharge to and draw working fluid from other portions of said isolated pressure zone, wherein the total volume of said isolated pressure zone is constant during operation of the machine to reduce the capacity of the machine to receive and discharge working fluid; and

means for maintaining the pressure of the working fluid in said isolated pressure zone at all times during machine operation, at a pressure intermediate and a predetermined function of the supply and exhaust pressures of working fluid to and from the machine.

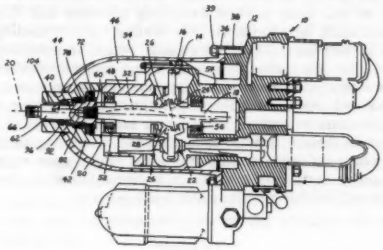
4,532,855
TWO-PART DRIVE SHAFT FOR THERMAL ENGINE

Roelf J. Meijer; Benjamine Ziph, and Ted M. Godett, all of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Apr. 4, 1984, Ser. No. 596,222

Int. Cl.³ F01B *3/02, 13/04, 29/10*

U.S. Cl. 92—71 **10 Claims**



1. In a thermal engine in which thermal energy is converted to mechanical energy of rotation, said engine comprising housing structure, a drive mechanism cooperatively associated with said housing structure including a variable swashplate mechanism journaled on said housing structure for rotation about an axis to deliver mechanical energy of rotation via a drive shaft providing a power takeoff point on the exterior of the engine for delivery of engine power to any utilization mechanism which may be operatively coupled with the engine, and pressure sealing means for sealing said drive shaft with respect to said housing structure to prevent loss of internal pressure from the engine between said drive shaft and said housing structure, the improvement which comprises journal means for journaling said variable swashplate mechanism on said housing structure such that said housing structure reacts, via said journal means, bending loads developed by the operation of said swashplate mechanism, and a further shaft separate from the journaled swashplate mechanism but operatively coupled with said swashplate mechanism and disposed between said power takeoff point and said swashplate mechanism, further journal means journaling said further shaft on said housing structure, said further journal means and said first-mentioned journal means being independent of each other, whereby said further shaft is substantially isolated from such bending loads, and wherein said pressure sealing means has an operative association with said further shaft so as to also be substantially isolated

from such bending loads and said engine including pressure hull structure having a cooperative association with said housing structure whereby an interior space is cooperatively defined by said pressure hull structure and said housing structure and which is subjected to pressure different from that on the exterior of the engine, said pressure hull structure being cooperatively associated with said housing structure such that said housing structure passes through and is sealed relative to an aperture in said pressure hull structure which aperture is coaxial with said further shaft.

4,532,856

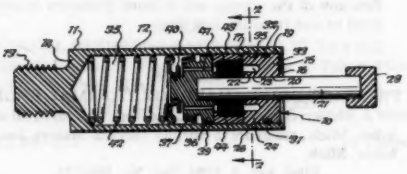
END CAP FOR FLUID CYLINDER

Douglas P. Taylor, North Tonawanda, N.Y., assignor to Tayco Developments, Inc., North Tonawanda, N.Y.

Filed Feb. 3, 1984, Ser. No. 576,890

Int. Cl.³ F16J *10/02, 15/18*

U.S. Cl. 92—168 **19 Claims**



1. An end cap for a cylinder comprising a plastic body portion having an outer surface and first and second ends, a bore in said body portion extending between said first and second ends, an annular flexible sealing lip surrounding said bore at said second end, an annular recess surrounding said annular flexible sealing lip at said second end, a flexible annular outer body portion surrounding said annular recess at said second end, said annular recess permitting radial flexing of said flexible annular outer body portion both toward and away from said annular flexible sealing lip and permitting flexing of said annular flexible sealing lip, and protuberance means on said outer surface extending in a circumferential direction about said flexible annular outer body portion.

4,532,857

TUNNEL FOR REFRIGERATING, HEATING, OR DRYING PRODUCTS OF THE FOODSTUFFS AND ESPECIALLY THE CONFECTIONERY INDUSTRY

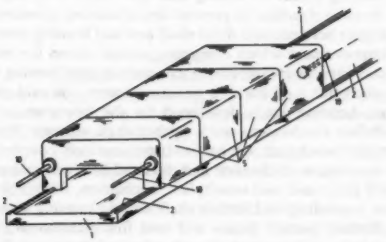
Helmut Sollich, Karschau 54, D - 2341 Rabenkirchen, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 564,092

Claims priority, application European Pat. Off., Dec. 7, 1983, 83112287.4

Int. Cl.³ A23L *3/00*

U.S. Cl. 99—483 **11 Claims**



1. Tunnel for refrigerating, heating, or drying products of foodstuffs and particularly the confectionery industry; comprising a plurality of hoods arranged in series along the length of the tunnel; base means for supporting said hoods, said hoods being arranged in substantially close contact on said base means; spreader means for lifting said hoods off said base means; conveyor belt means within said tunnel; said spreader means connecting said hoods to said base means; each hood being liftable off said base means and above said conveyor belt means independent of the other hoods.

4,532,858

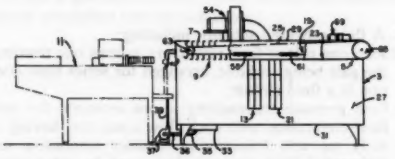
APPARATUS FOR SHOWER APPLYING LIQUID SMOKE

Robert R. Hershfeld, St. Louis County, Mo., assignor to The Baltimore Spice Company, Baltimore, Md.

Filed Sep. 19, 1983, Ser. No. 533,411

Int. Cl.³ A23B *4/00*

U.S. Cl. 99—534 **15 Claims**



1. Apparatus for the surface application of liquid smoke to edible articles, said apparatus comprising a conveyor movable along a path from a loading station into a smoke shower station, to a drying station, and thence to an unloading station, comprising, said apparatus including the liquid smoke shower station and having a chamber at least partially enclosing a portion of said conveyor with said edible articles thereon, a reservoir for the apparatus and holding a supply of liquid smoke, a plurality of shower nozzles operatively associated with the apparatus and positioned so as to spray liquid smoke on said edible articles carried by said conveyor within said chamber, a pump operatively associated with the apparatus and useful for drawing liquid smoke from said reservoir and for spraying said liquid smoke from said shower nozzles in large, discrete droplets or in a substantially continuous liquid stream onto said edible articles with the excess liquid smoke returning to said reservoir, said apparatus incorporating a cabinet having an inlet door for said conveyor and an outlet door for said conveyor, said conveyor being of the endless chain type and having a plurality of support means thereon from which the edible articles may be suspended, and said chain being entrained around a plurality of sprockets including a series of said sprockets maintained within the cabinet for movement of the endless chain therethrough, and a plurality of said sprockets being located exteriorly of said cabinet for support and movement of the endless chain along its predetermined path and to accommodate the loading and unloading of edible articles thereon.

4,532,859

METHOD FOR IDENTIFICATION OF METAL BOXES OR CANS AND AN APPARATUS FOR CARRYING OUT SAID METHOD

Steinar Solordal, Hvalstad, Norway, assignor to A/S Tomra Systems, Asker, Norway

Filed Nov. 1, 1983, Ser. No. 547,741

Claims priority, application Norway, Nov. 1, 1982, 823621

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—35 **19 Claims**

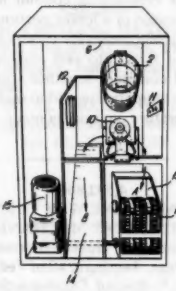
1. A method for identification and separation of metal boxes or cans comprising:

placing said can in a motor-controlled cradle;

rotating said cradle in a first direction from a starting position to a first position with a first stepping frequency;

rotating said cradle in a second and opposite direction into a second position with a second stepping frequency;

measuring the time required to return said cradle from said first position to said second position; and



discharging said can as a function of said time measurement either by further rotation of said cradle in said second direction or by rotating said cradle back in said first direction and past said first position.

4,532,860

APPARATUS FOR COLLECTING WASTE FROM A TEXTILE MACHINE

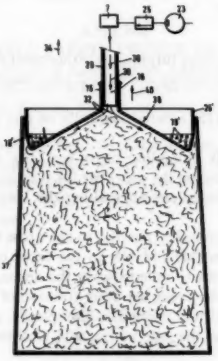
Dionizy Simson, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 18, 1984, Ser. No. 571,688

Claims priority, application European Pat. Off., Jan. 21, 1983, 83 810024.6

Int. Cl.³ B30B *9/00*

U.S. Cl. 100—90 **10 Claims**



1. An apparatus for collecting waste from a textile machine, said apparatus comprising

a container;

first means defining an inlet to said container to deliver a flow of waste-laden carrier medium into said container;

at least one movable wall in said container for compressing waste therein; and

second means in said movable wall defining an outlet from said container to exhaust carrier medium from said container while retaining waste within said container.

4,532,861

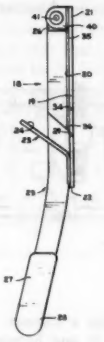
CAN CRUSHER

Paul D. Gisselberg, III, E. 610 - 42nd, Spokane, Wash. 99203

Filed Apr. 25, 1984, Ser. No. 603,714

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—233 **8 Claims**



1. A can crusher, comprising:

a base having a flat anvil surface thereon extending between opposed base ends;

a rigid elongated lever having a handle at an outward handle end and a remaining inward end;

a crusher surface on the lever adjacent the remaining lever end extending along the lever from an end adjacent the remaining lever end to an outward end spaced toward the lever handle;

bracket means mounted on the base at one of the base ends thereof for mounting the lever at the end end for pivotal movement about an axis parallel to the flat anvil surface, between a closed position with the flat crusher surface in flush engagement with the anvil surface, and an open position wherein the flat crusher surface is pivoted away from the anvil surface to a can receiving position such that a can may be received between the crusher and anvil surface; and

a stationary abutment affixed to the base at the end thereof opposite the one end mounting the bracket means, having a can end abutment surface thereon inclined at an acute angle to the anvil surface and adjacent the outer crusher surface end, said abutment being slotted to receive the lever with the abutment surface extending to opposite sides of the lever at the closed position thereof.

4,532,862

PRINT HAMMER BANK

James R. Moss, Lum, Mich., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Jul. 1, 1983, Ser. No. 509,925

Int. Cl.³ B41J *9/10*

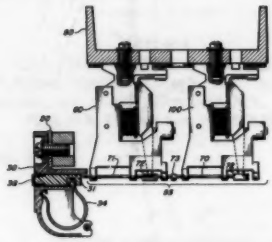
U.S. Cl. 101—93.32 **4 Claims**

1. A free-flight hammer, impact-printing apparatus utilizing a shifting hammer bank, the hammers of which strike a moving record medium normally relative to the medium surface, the apparatus comprising:

a plurality of interchangeable actuator modules responsive to electric signals, each of said actuator modules including at least one actuator assembly which includes a means for housing a stator, a solenoid assembly and an armature, said stator being locked in said stator housing, said solenoid assembly being mounted between said stator and said armature, said armature being attached to said stator and including flexure means which allows said armature to move relative to said stator, said stator housing further

including a guide means for pushrods, one of said pushrods being a capturing pushrod which includes means for capturing a portion of said armature to allow said armature to contol the movement of said capturing pushrod;

a plurality of interchangeable hammer modules including a plurality of individual linear motion, slidable hammers, said individual hammers being slidably mounted in a side by said relationship in a hammer housing which includes



means for capturing a hammer return spring for each hammer mounted in said hammer housing, one end of each of said springs being attached to a corresponding hammer, said hammers and springs being held in said hammer housing by a securing means positioned against said springs;

means for mounting said actuator modules relative to said hammer modules so that said pushrods cause the firing of individual hammers of said hammer modules.

4,532,863

METHOD AND APPARATUS FOR CONTROLLING THE TEMPERATURE IN ROTATING PRINTERS

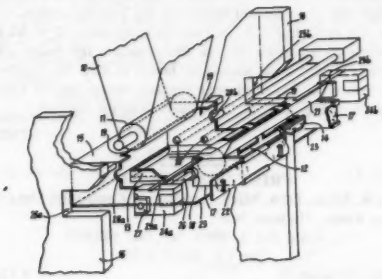
Guy Bavoux, Coye la Foret, and Arthur B. Dallaserra, Aulnay Sous Bois, both of France, assignors to Herve Et Fils, S.A., Paris, France

Filed Nov. 15, 1982, Ser. No. 441,676

Claims priority, application France, Jan. 26, 1982, 82 01190

Int. Cl.³ B41F *9/06*

U.S. Cl. 101—153 **17 Claims**



1. A rotating printing device comprising:

(a) an enclosure containing a printing cylinder, said enclosure including a window;

(b) a pressure roller comprising means for supporting a web on which a product is to be applied, said window comprising means for allowing at least a portion of said pressure roller to pass into said enclosure simultaneously with at least a portion of said web, said pressure roller also comprising means for forming a contact zone with said web and means for applying said contact zone against said printing cylinders;

(c) a container comprising means for holding said product for application to said printing cylinder, said container being enclosed by said enclosure;

(d) gas flow means for providing a flow of gas at a controlled temperature to said enclosure, said contact zone being positioned in said flow of gas, said gas flow means comprising one gas conducting conduit having an inlet for pulsating air located in a lower portion of said enclosure, said inlet comprising means for conducting said controlled temperature gas flow into said enclosure, said gas flow means and said container together comprising means for maintaining the temperature within said product container and the temperature at said contact zone substantially equal.

4,532,864

PRINTING MACHINE WEB TURNING BAR ADJUSTMENT MECHANISM

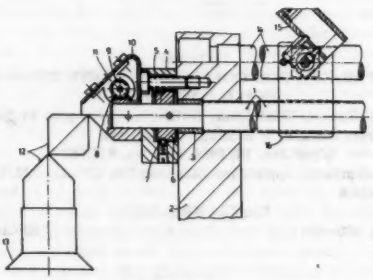
Albert Heller, Pestenacker; Hubert Birkmair, Friedberg, and Hermann Grauberger, Augsburg, all of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,803

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 8211907[U]

Int. Cl.³ B41F *13/06*

U.S. Cl. 101—219 **3 Claims**



1. Printing machine turning bar adjustment mechanism for a printing machine having a side wall (2) comprising

a side wall (2);

a turning bar (15) located inwardly of one side of the side wall;

a longitudinally extending cross bar (14), the turning bar being mounted on the cross bar for positioning the turning bar in adjustable positions along the length thereof, and including

a spindle (1) extending parallel to the cross bar (14);

coupling means (16) slidable on the cross bar (14) and engageable by the spindle to move the turning bar longitudinally along the cross bar upon rotation of the spindle;

an extending portion formed on the spindle, projecting from the spindle at the side of the side wall remote from the turning bar;

a holding flange (4) secured to the side wall and rotatably retaining the extending portion of the spindle;

a positioning wheel (6) located within the holding flange (4) coupled to the extending portion of the spindle (1) and having spring-loaded ball and detent means (7) for engaging the positioning wheel and locating the positioning wheel, and hence the spindle (1), at predetermined angular positions;

a worm (8) formed on the spindle (1);

a gear (9) in engagement with the worm and forming, in combination with the worm, a reduction gearing;

a numerical revolution indicator (10, 11) coupled to the gear

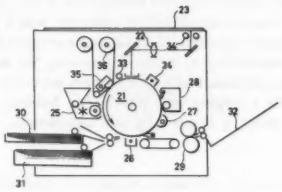
(9), the numerical revolution indicator including a plurality of number wheels;
and a drive wheel (13) coupled to the spindle, independently of the worm (8) and the gear.

4,532,865

ELECTROSTATIC PRINTING METHOD USING HEAT SENSITIVE THERMAL INK TRANSFER

Masaki Yoshino, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1983, Ser. No. 516,090
Claims priority, application Japan, Jul. 22, 1982, 57-126663
Int. Cl.³ B41C *1/00*
U.S. Cl. 101—426 **3 Claims**



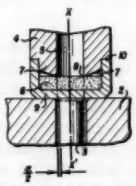
1. An electrostatic printing method comprising the steps of:
(a) operating a thermal head in accordance with electrical signals representative of image data;
(b) transferring heat-sensitive ink onto a photosensitive sheet from a donor sheet disposed between said thermal head and said photosensitive sheet to form a master sheet to thereby form ink images representative of said image data;
(c) charging said master sheet;
(d) uniformly exposing said master sheet to form an electrostatic latent image on said ink images;
(e) developing said latent image into a toner image with powdered toner;
(f) transferring said toner image to a recording sheet; and
(g) fixing said toner image on said recording sheet.

4,532,866

COMBUSTIBLE SAFETY PRIMER OF SELECTIVE PERCUSSION FOR CASE-LESS AMMUNITION OR AMMUNITION WITH COMBUSTIBLE CASE

Guy J. Lagofun, Tarbes, France, assignor to L'Etat Francais, Paris, France

Continuation-in-part of Ser. No. 322,876, Nov. 19, 1981, , which is a continuation of Ser. No. 61,024, Jul. 26, 1979,. This application Oct. 13, 1983, Ser. No. 541,508
Int. Cl.³ F42C *19/10*
U.S. Cl. 102—204 **7 Claims**



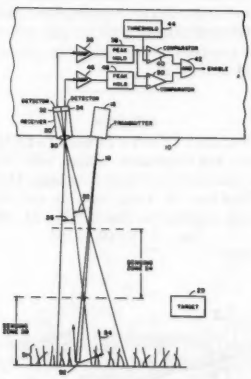
1. A percussion primer for case-less ammunition or ammunition with combustible case for a weapon utilizing a firing pin with a flat end, comprising:
a combustible propellant block, one end of which is in the form of a conical surface for functioning as an anvil and a vent formed in said block;
a wholly combustible sensitive primer composition;
and combustible means for holding the primer composition in contact with the conical anvil surface of said block;
said vent aligned to be coaxial with the firing pin of a weapon in which said ammunition may be fired and extending through the conical end of the block;
said anvil being defined by the sharply edged intersection of the conical end of the conical end surface of the block and the internal surface of the vent; and
the diameter of the cross section of the flat ended firing pin being less than that of said vent so that the clearance in mm between them will be $0 < E \leqq 5/10$ so that the initiation of said primer composition is obtained substantially only by shearing of said primer composition.

4,532,867

DUAL FIELD-OF-VIEW OPTICAL TARGET DETECTOR

Robert R. Mitchell, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 7, 1983, Ser. No. 511,602
Int. Cl.³ F42C *13/02*
U.S. Cl. 102—213 **6 Claims**

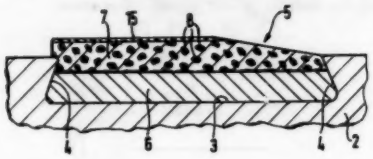


1. A dual field-of-view detection system comprising: a receiver having first and second detecting means therein disposed to provide respective adjacent directional fields-of-view for receiving reflected electromagnetic radiation, a transmitter for directing electromagnetic radiation into the fields-of-view of said receiver detection means for establishing first and second sensing zones where the respective fields-of-view and the transmitted radiation are coincident, and comparison means coupled to said first and second detection means for comparing reflected radiation from said first and second sensing zones as detected by said first and second detection means to provide an output signal when the radiation sensed by the first detection means exceeds both a predetermined bias level and the radiation sensed by the second detection means.

4,532,868
ROTATING BAND FOR PROJECTILES

Winfried Gleichaut, Oberndorf; Oswin Günther; Dietrich Hoffmann, both of Schramberg, and Rolf Funke, Bad Schonborn, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH and Karl Schmidt GmbH, both of, Fed. Rep. of Germany

Filed Dec. 22, 1983, Ser. No. 564,209
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248011
Int. Cl.³ F42B *31/00*
U.S. Cl. 102—527 11 Claims



1. A projectile having a caliber and adapted to be fired from a rifle bore having rifling with lands and grooves, comprising:

a projectile body having an external circumferential groove; and

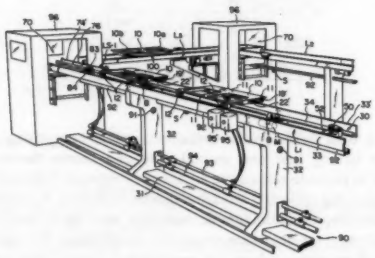
a rotating band in said groove comprising a compound slide bearing;

said rotating band including a radial inner carrier having an outer diameter which is smaller than the projectile caliber so that the lands of the rifling do not cut into said carrier, a split annular one piece porous metal slide layer over and secured to the exterior surface of said carrier, said slide layer having ends, a polytetrafluoroethylene filling pores of said porous metal slide layer, a cover layer of polytetrafluoroethylene over said slide layer, said slide layer having an outer cylindrical surface covered by said cover layer, and means for positively engaging said ends of said slide layer which comprise a latch tongue on one end of said slide layer engaged with a receiving groove on the other end of said slide layer.

4,532,869
PALLET CONVEYING SYSTEM

Hirokazu Kondo, and Shigekatsu Takino, both of Osaka, Japan, assignors to Tsubakimoto Chain Company, Osaka, Japan

Filed Sep. 24, 1982, Ser. No. 423,375
Claims priority, application Japan, Aug. 24, 1982, 57-14557
Int. Cl.³ B61B *13/00*
U.S. Cl. 104—166 9 Claims

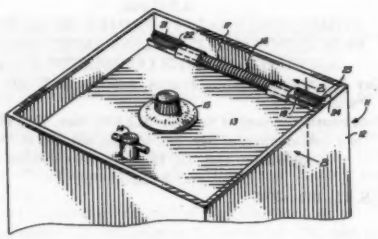


1. A pallet conveying system for a pallet having stop and lock pins projecting therefrom, comprising pallet guide rails supported on a frame, a driving shaft extending along said guide rails, motor means for driving said driving shaft, a turntable mechanism disposed at the end of said pallet guide rails and having changeover rails alignable with said guide rails and a changeover driving shaft alignable with said driving shaft, a driven roller pivotally attached to the underside of a pallet and urged so as to be pressed against the circumference of said driving shaft with the axis of rotation thereof diagonally positioned with respect to the axis of said driving shaft, front and rear lever means pivotally mounted on and projecting from the front end and the rear end, respectively, of the pallet, link means connected between said driven roller and said front and rear lever means for causing the axis of rotation of said driven roller to be parallel to the axis of said driving shaft when either said lever means is retracted, a pallet stopping and positioning mechanism disposed at a predetermined position adjacent said guide rails for causing the axis of rotation of said driven roller to be approximately parallel to the axis of said driving shaft and for stationarily holding the stop pin projecting from the underside of the pallet when the mechanism is in a projected position, the mechanism including a stopper and a movable positioning member positioned adjacent the stopper for holding the stop pin therebetween, means for moving the mechanism into a retracted position, and locking means movable into a locking position for engaging and stationarily holding said lock pin when the pallet is stopped by said mechanism.

4,532,870
SAFE APPARATUS

Gary D. Hayman, 96 Mark David Ct., Casselberry, Fla. 32707

Filed Sep. 27, 1982, Ser. No. 424,032
Int. Cl.³ E05G *1/026*
U.S. Cl. 109—58 8 Claims



1. A safe apparatus comprising in combination:

a security container having an opening thereinto;

a safe door covering said opening into said security container and having a lock attached thereto;

hinge means for hinging said safe door to said security container, said hinge means having at least one hinge pin attached to said door and a hinge pin support grooved for nesting said hinge pin therein, said hinge pin support groove being open along one side thereof at least the width of the diameter of said hinge pin to allow said safe door to be removed from said security container by separating said hinge pin from said grooved support upon lifting an opened safe door; and

means for preventing the separation of said safe door from said container when said safe door is closed.

4,532,871
FLUIDIZED BED COMBUSTION APPARATUS

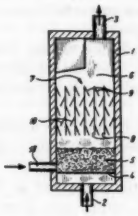
Max L. G. Van Gasselt, Apeldoorn, and Louis M. Rappoldt, Ugchelen, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast, The Hague, Netherlands

Filed Feb. 15, 1984, Ser. No. 580,413

Claims priority, application Netherlands, Feb. 18, 1983, 8300617

Int. Cl.³ F23J *3/00*

U.S. Cl. 110—216 **9 Claims**



1. A fluidized bed combustion apparatus, comprising:
(a) a housing,
(b) support means in the housing adjacent the bottom thereof for supporting a bed of particulate material including particulate combustible material,
(c) particulate infeed means adjacent the support means for supplying particulate material to said support means,
(d) air inlet means in the housing below the support means for supplying combustion air to a bed of particulate material on the support means,
(e) combustion gas outlet means in the top of the housing,
(f) a plurality of upwardly directed channel walls in the housing above the support means defining a channel between adjacent walls, and
(g) a pair of opposed arrays of superimposed plates in each channel, the plates of one array of the pair extending obliquely downward and inward from one channel wall, and the plates of the other array of the pair extending obliquely downward and inward from the opposite wall of said channel.

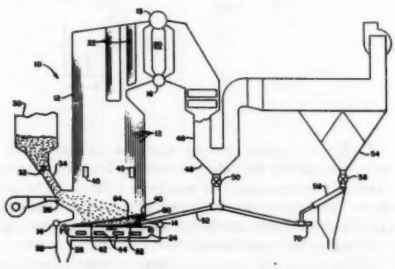
4,532,872
CHAR REINJECTION SYSTEM FOR BARK FIRED FURNACE

David K. Anderson, East Longmeadow, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 17, 1984, Ser. No. 682,442

Int. Cl.³ F23G *5/12*

U.S. Cl. 110—255 **1 Claim**



1. In combination, a furnace for burning cellulosic fuel therein, a traveling grate in the furnace bottom having an upper run and a lower run, and also having a first end positioned adjacent a first wall of the furnace, and a second end located adjacent a second opposite wall of the furnace, a discharge chute located beneath the second end of the traveling grate through which ashes fall, means for continuously moving the upper run of the grate towards the second wall, inclined baffle means extending outwardly and downwardly from the first wall so as to extend above a portion of the first end of the traveling grate, means for introducing raw cellulosic fuel into the furnace in such a manner that part of it lands on top of the baffle means, sliding down onto the upper run, means for separating char particles out the combustion gases leaving the furnace, means for introducing said char particles onto the upper run of the grate at a location beneath the baffle means, so that as they move from beneath the baffle means they are covered with a layer of cellulosic fuel sliding down off the baffle means, thus preventing the relatively light char particles from becoming reentrained in the combustion gases flowing upwardly through the furnace before they are completely combusted.

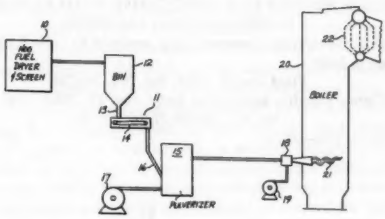
4,532,873
SUSPENSION FIRING OF HOG FUEL, OTHER BIOMASS OR PEAT

John Rivers, Normandy Park; Charles D. Kramer, Montesano, and Robert L. Cox, Hoquiam, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation-in-part of Ser. No. 377,279, May 12, 1982, abandoned. This application Feb. 15, 1984, Ser. No. 580,407

Int. Cl.³ F23D *1/00*; C10L *5/44*

U.S. Cl. 110—347 **8 Claims**



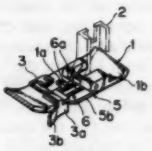
1. A process for burning a wet organic fuel in a water wall or other cold wall type boiler which comprises:
providing at least one swirl stabilized burner adapted for burning a powdered fuel;
drying the wet fuel to an average moisture content less than about 30% with at least a portion of the finer particles having a moisture content not exceeding about 20%;
pulverizing the dried fuel so that at least 60% by weight of the particles are finer than about 1000 microns and at least 15% of the particles are finer than about 150 microns,
adjusting the fraction of the less than about 150 micron particles in the pulverized portion so that the fuel will produce a self-sustaining flame;
conveying the dried and ground particles to the burner while suspended in a stream of primary air; and
igniting the particles, whereby the less than about 150 micron fraction provides sufficient ignition energy to sustain stable combustion of the entire fuel.

4,532,874

HEM STITCHING PRESSER FOOT FOR A ZIGZAG SEWING MACHINE

Yasukata Eguchi, and Mikio Inamori, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,786
Claims priority, application Japan, Jan. 6, 1983, 58-89[U]
Int. Cl.³ D05B *29/12, 35/02*
U.S. Cl. 112—235 **10 Claims**



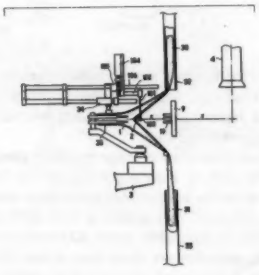
1. A hem stitching device, of a zigzag sewing machine, having a fabric feed direction, for forming a hem on a fabric, comprising: a presser holder; a fabric presser member pivotally mounted to said presser holder and having one end, a fabric presser portion and a needle drop hole; a fabric guide member disposed a distance from said presser holder; and a thread guide member having a thread guide portion fixed to said fabric guide member, said thread guide member being composed of a wire material, said fabric guide member being fixed to said fabric presser member at said one end, and said fabric presser portion located between and substantially opposite said needle drop hole and said thread guide member and being formed so as to press the fabric between said thread guide portion of said thread guide member and said needle drop hole of said fabric presser member.

4,532,875

PROCESS AND A MACHINE FOR THE AUTOMATIC TRANSFER OF PANTYHOSE FROM A MACHINE WHICH PRODUCES A PANTYHOSE WITH SEAMS TO A GUSSET-SEWING MACHINE

Vinicio Gazzarrini, Florence, Italy, assignor to Solis S.r.l., Florence, Italy

Filed Jan. 6, 1984, Ser. No. 568,700
Claims priority, application Italy, Jan. 21, 1983, 9316 A/83
Int. Cl.³ D05B *21/00, 97/00*
U.S. Cl. 112—262.2 **17 Claims**



1. A process for the automatic transfer of pantyhoses from a machine which produces pantyhoses with seams to a machine for sewing the gussets of pantyhoses, comprising:

leaving a preliminary horizontal opening out of the edge of the garment both after the garment has left the pantyhose machine and during the horizontal approach of the garment to a catching device,

leaving said preliminary opening during the separate drawing of the legs of the garment into appropriate tubes; and

leaving said preliminary horizontal opening out of the edge of the garment seamless, so that, when the garment reaches said catching device, the edge of said opening is arranged around closed prongs forming part of said catching device.

8. Apparatus for the automatic transfer of pantyhose from a first machine for seaming pantyhose to a second machine for applying a gusset to the pantyhose, wherein the pantyhoses leaving the first machine each have a transverse opening to which the gusset is to be applied, and the gusset applying machine includes tubes into which the legs of the pantyhose are drawn, comprising:

a pronged gripping device having prongs adapted to enter into the transverse opening for gripping the pantyhose;

a pair of arms symmetrically positioned relative to one of said tubes;

a shaft for each of said arms onto which said arms are articulated, said shafts being rotatable about their own axes and movable relative to each other;

claws for gripping the pantyhose at the edge of the transverse opening to permit said prongs to enter into said transverse opening; and

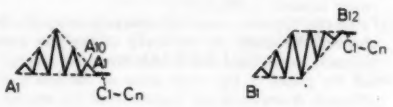
means to open said prongs to open the transverse opening to its maximum extent prior to applying the gusset.

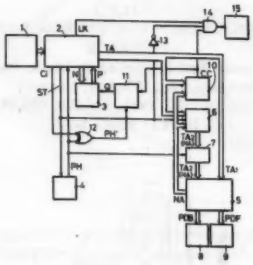
4,532,876

ELECTRONIC SEWING MACHINE

Takeshi Kongoh, and Haruhiko Tanaka, both of Tokyo, Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,680
Claims priority, application Japan, May 18, 1983, 58-85796
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—454 **2 Claims**





1. An electronic sewing machine having stitch forming instrumentalities including a needle laterally swingable and vertically reciprocated to penetrate a fabric to be sewn and a fabric feeding device operated in a timed relation with the needle to transport the fabric, said electronic sewing machine comprising, in combination,

(a) an electronic memory storing stitch control data predetermined specific to respective stitch patterns which may be sequentially read out to control the stitch forming instrumentalities, said stitch control data being composed of a set of coordinate determining data of needle penetrat-

ing points which are sequentially connected to thereby form stitches of a selected pattern;

(b) switch means for selecting a desired one or combination of the stitch patterns to thereby give a corresponding pattern number for the selected pattern to address said electronic memory for sequentially reading out the stitch control data specific to the selected pattern;

(c) first detection means for detecting whether the selected combination of the patterns includes a lock stitch pattern at the last thereof, said means being adapted to produce a signal when the lock stitch pattern is included in the selected combination;

(d) stop means operated in response to said signal from said first detecting means for stopping the sewing machine operation after the lock stitch pattern is finished;

(e) second detection means for detecting whether the selected pattern designated to be followed by the lock stitch pattern belongs to a first or second group, said first group comprising stitch patterns whose stitch control data are preset in said memory such that the last one stitch line necessary for completing a configuration thereof does not extend to the first stitch of the next pattern, and said second group comprising stitch patterns whose stitch control data includes the coordinate determining data of the last needle penetrating point of a first pattern which is identical to the first needle penetrating point of a succeeding pattern, said second detection means being adapted to produce a selective one of a first group command signal and a second group command signal in accordance with the detection; and

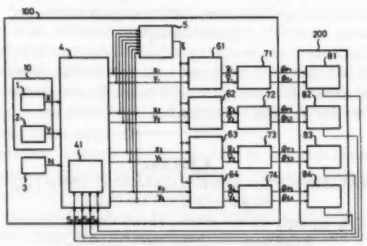
(f) control means operated in response to said first or second group command signal from said second detection means to control the operation of said memory for starting the lock stitch forming operation at a time differently determined in dependence upon the detection by said second detection means, whereby the lock stitch pattern is connected to the last point of the configuration of the pattern designated to be followed by the lock stitch, independently of whether the pattern belongs to said first or second group.

4,532,877

MANEUVERING SYSTEM OF WATERCRAFT AND THE LIKE

Osamu Nagata, Kobe; Masanari Inagaki, Akashi, and Hajime Yamada, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed May 10, 1983, Ser. No. 493,165
Claims priority, application Japan, May 18, 1982, 57-84497
Int. Cl.³ B63H *25/52*
U.S. Cl. 114—144 E **2 Claims**



1. A maneuvering system of watercraft provided with a plurality of thrusters, said maneuvering system comprising:

thrust setting means, and moment setting means for setting a thrust and a turning moment respectively, to be imparted to the watercraft;

thrust allocation means operatively connected to said thrust setting and moment setting means for having inputted thereto a resultant thrust instruction signal supplied from said thrust setting means, and a moment instruction signal supplied from said moment setting means, and for supplying thrust instruction signals to the respective thrusters for outputting corresponding thrusts, said thrusts being composed of a resultant thrust and a moment coincident with said set thrust and moment;

reduction rate operation means for comparing the thrust instruction signals supplied to the respective thrusters with signals of predetermined maximum allowable thrusts for the respective thrusters to calculate reduction rates for reducing the thrust instruction signals to the signals of said predetermined maximum allowable thrusts respectively and selectively and to select the maximum reduction rate signal among said reduction rate signals; and

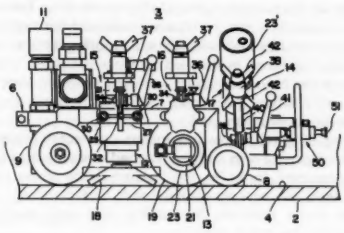
thrust reduction means performing a reduction operation on all of the thrust instruction signals supplied to the respective thrusters by said maximum reduction rate.

4,532,878

APPARATUS FOR ABRASIVE CLEANING

Minoru Shiraishi, Kumamoto; Yoshimi Numata, Nagasu; Hiroshi Tano, Maizuru, and Tatsumi Onaka, Amagasaki, all of Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Filed Jan. 6, 1984, Ser. No. 568,616
Int. Cl.³ B24B *27/00*; B63B *59/00*
U.S. Cl. 114—222 **9 Claims**



1. An apparatus for abrasive cleaning comprising a truck adapted to run on a first surface and along a second surface substantially perpendicular to the first surface, a first abrasive cleaner mounted on the truck by first support means substantially perpendicularly to the first surface and having at its one end a first abrasive cleaning tool adapted to contact the first surface, first biasing means for pressing the first abrasive cleaner against the first surface, a second abrasive cleaner mounted on the truck by second support means substantially perpendicularly to the second surface and having at its one end a second abrasive cleaning tool adapted to contact the second surface, and second biasing means for pressing the second abrasive cleaner against the second surface,

wherein each abrasive cleaner comprises a main body having a substantially cylindrical outer surface, and the corresponding support means includes a holding cylinder surrounding the main body outer surface and provided at each of its opposite ends with inwardly directed annular flange means to define an adjoining annular channel, a gap being formed between the flange means and the main body outer surface, the annular channel radially movably retaining therein guide balls having a diameter larger than the depth of the annular channel and adapted to contact the main body outer surface, the difference between the ball diameter and the channel depth being smaller than said gap, whereby the first and second abrasive cleaners are supported by the first and second support means so as to be limitedly movable in the direction of first and second axes substantially perpendicular to the first and second surfaces, respectively, and so as to be limitedly tiltable in

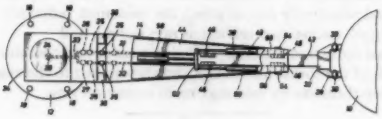
every direction with respect to the first and second axes, respectively.

4,532,879

COMBINATION MOORING SYSTEM

John E. Ortloff, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Jun. 4, 1984, Ser. No. 594,086
Int. Cl.³ B63B *21/00*
U.S. Cl. 114—230 **14 Claims**



1. An apparatus for mooring a floating vessel to a base, wherein the vessel is acted upon by a loading force induced by wind, waves, floating ice, or an ocean current, comprising:

a first mooring arm connected to the vessel;

a second mooring arm connected to said base such that said second mooring arm is in sliding engagement with said first mooring arm to permit movement between the vessel and the base, wherein said first mooring arm is initially at a mean position relative to said second mooring arm when the vessel is not acted upon by the loading force;

first hydraulic pressure means connected between said first mooring arm and said second mooring arm to furnish a restoring force, as the loading force urges the vessel away from the base to displace said first mooring arm from the mean position, for urging said first mooring arm toward the mean position; and

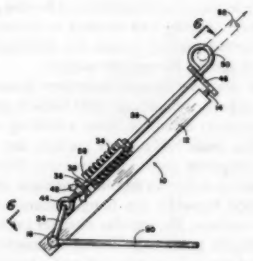
second hydraulic pressure means connected between said first mooring arm and said second mooring arm to furnish a restoring force, as the loading force urges the vessel toward the base to displace said first mooring arm from the mean position, for urging said first mooring arm toward the mean position.

4,532,880

BOAT ANCHOR

Richard J. Dyer, Broken Arrow, and Robert S. Tarpley, Mannford, both of Okla., assignors to Diamondback Marine Products, Inc., Tulsa, Okla.

Filed Apr. 16, 1984, Ser. No. 600,448
Int. Cl.³ B63B *21/24*
U.S. Cl. 114—298 **5 Claims**



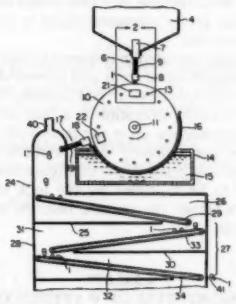
1. An anti-fouling anchor for boats and comprising shank means, transversely extending rod means journalled at one end of the shank means, anchor blade means secured to the transverse rod means for selective engagement with the bottom of a body of water for securing the boat in a preselected position therein, spring urged release rod means having a normal position of engagement with the shank means and releasable from the shank means upon a fouling of the anchor blade means whereby the anchor blade means may be released from the fouled position thereof, wherein the release rod means comprises connecting means pivotally secured to the transverse rod means, elongaged rod means having one end yieldably secured to the connection means and the opposite end releasably engagable with the shank means, and means provided at the outer end of the elongated rod means for engagement from the boat for actuation of the rod means for releasing the anchor blade means from the fouled position thereof, and including spring means for yieldably securing the elongated rod means to the connection means.

4,532,881

PROCESS FOR SEALING BODY AND CAP OF GELATIN HARD CAPSULE AND APPARATUS THEREFOR

Shigeru Sakashita, Gifu; Takeshi Nakagawa, Kagamigahara; Takayuki Ohwaki, and Yasuo Miyake, both of Inuyama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 589,976, Mar. 15, 1984, Pat. No. 4,510,168.
This application Jul. 16, 1984, Ser. No. 631,423
Claims priority, application Japan, Mar. 24, 1983, 58-49579
Int. Cl.³ A23G *3/20*
U.S. Cl. 118—20 **7 Claims**



1. An apparatus for sealing a body and a cap of a gelatin hard capsule which includes a solvent tank receiving a solvent; a rotary disk which is mounted on a horizontal rotary shaft and provided on its outer periphery with capsule-receiving portions each of which receives one capsule separately, said capsule-receiving portions being designed to pass through the solvent stored in said solvent tank; and a drying means for separately drying the capsules taken out above the surface of said solvent from the capsule-receiving portions and accommodating a capsule transfer means therewithin, said capsule-drying means comprises a first drying chamber within which a cold wind zone is formed and a second drying chamber connected to said first drying chamber, inside said second drying chamber there being formed a hot wind zone.

4,532,882

MACHINE FOR SPREADING AND SMOOTHING SURFACE COVERINGS

Pierre H. Ciraud, 23, rue d'Isly, 16100 Cognac, France

Filed Sep. 28, 1982, Ser. No. 425,399
Claims priority, application France, Oct. 15, 1981, 81 19563
Int. Cl.³ B05C *11/04*
U.S. Cl. 118—108 **2 Claims**

1. A machine for spreading and smoothing surface coverings such as those containing synthetic resins, comprising:

(a) a frame mounted on wheels, at least one of said wheels being steerable;

(b) a hopper for storing and dispensing surface covering material and being mounted on said frame;

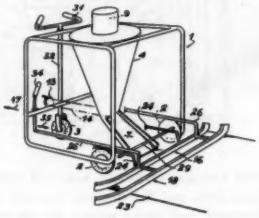
(c) means for mixing and blending the surface covering material in said hopper;

(d) a chute for discharging the surface covering material from said hopper and mounted at the lower end of said hopper;

(e) means for adjusting the flow of said surface covering material into said chute;

(f) a spreading blade for spreading surface covering material discharged from said chute and a smoothing blade for smoothing surface covering material spread by said spreading blade,

(g) means for raising and lowering said spreading and smoothing blades, said spreading and smoothing blades



being disposed transversely to the direction of displacement of said machine, said spreading blade being arranged facing the discharge end of said chute and said smoothing blade being arranged behind said spreading blade relative to the direction of displacement of said machine, said blades comprising strips of flexible material bearing on the ground, the general plane (21) of the straight middle portions of said flexible strips, on a level with the supporting means (20), being sloped upwardly and forwardly relative to the direction of displacement of the machine while said plane has a constant and maximal slope in the middle portion of said strips and has a diminishing slope toward the extremities of said strips, and the free edge of said strips lying tangentially to the ground.

4,532,883

PROCESS FOR CONTROLLING THE MICROBIAL ENVIRONMENT IN ABALONE MARICULTURE

George S. Lockwood, Carmel Valley, and John H. Phillips, Pebble Beach, both of Calif., assignors to Monterey Abalone Farms, Monterey, Calif.

Filed Oct. 14, 1983, Ser. No. 541,993

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—4 **25 Claims**

1. A process for culturing gastropod molluscs and other benthic motile marine and aquatic animals through the first months of life in a microbiologically controlled environment, comprising the steps of:

a. placing cleaned parent animals in bacteria-controlling baths of substantially bacteria-free seawater containing an antibiotic;

b. recovering eggs and sperm from the parent animals, and placing fertilized eggs in a hatching bath of substantially bacteria-free seawater containing an antibiotic;

c. separating hatched larvae from the hatching bath for immersion in a holding bath of substantially bacteria-free seawater containing an antibiotic; and

d. transferring developing larvae from the holding bath to a settlement bath of substantially bacteria-free seawater, the seawater containing an antibiotic and a selected species of beneficial bacteria resistant to the settlement-bath antibiotic.

4,532,884

DEVICE FOR APPLYING A FIXING MEDIUM TO COMPONENTS SUCH AS CHIP-TYPE COMPONENTS

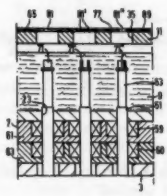
Josephus M. M. van Gastel; Hendrikus T. van Nunen, and Leonardus C. M. Sanders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 10, 1984, Ser. No. 598,634

Claims priority, application Netherlands, Nov. 4, 1983, 8303797

Int. Cl.³ B05C *1/00*

U.S. Cl. 118—243 **10 Claims**



1. A device for applying a viscous medium simultaneously to the lower side of each of a plurality of components, comprising

a container having a bottom, for containing a quantity of viscous medium filling the container at least to a given level,

a plurality of stamps, each having a respective stamp head, arranged in a regular geometric pattern, and

means for simultaneously displacing said stamps from a lower rest position, in which each stamp head is below said level, to an upper working position in which each stamp head projects above the container,

characterized in that each stamp comprises a respective one of a plurality of identical stamp pins each having an upper end and a lower end, elongated in the displacement direction; and a respective exchangeable attachment disposed on the respective pin upper end, said attachment comprising the stamp head,

said means for displacing engages the respective lower ends of the stamp pins,

the device further comprises means for preventing rotation of said pins about an axis parallel to the displacement direction, and

said container further comprises a cover having a corresponding plurality of identical openings arranged in said pattern, aligned with said pins, each opening having a size permitting passage therethrough of the largest cross-section attachment; and means for supporting said plurality of components in line with respective openings in the cover.

4,532,885

APPARATUS FOR APPLYING INTERNAL COATINGS IN HOT VESSELS

Erwin J. Nunlist, Penfield, N.Y., assignor to Kennecott Corporation, Cleveland, Ohio

Filed Nov. 5, 1984, Ser. No. 668,587

Int. Cl.³ B05B *7/00, 5/00*

U.S. Cl. 118—308 **5 Claims**

1. An apparatus for distributing a stream of solidifiable finely divided vitreous coating material onto a heated internal surface of a concave article which comprises:

(a) a substantially horizontal disc rotor having a plurality of radially directed vanes thereon for centrifugally outward distributing finely divided vitreous material,

(b) said vanes extending short of the rotor center portion, defining a central chamber,

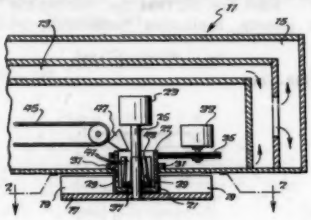
(c) said rotor rotatably connected to a motor means by a shaft extending through said central chamber,

(d) a cylindrical cage means positioned within said central chamber having a discharge opening positioned along the bottom periphery thereof adapted to meter a supply of

finely divided vitreous material to the vane area of said rotor,

(e) means to rotate said cage means within said chamber to move said discharge opening,

(f) a hollow central impeller connected for rotation with said rotor spacedly positioned within said cage means, said



impeller having a plurality of openings in the lower periphery thereof adapted to receive a supply of finely divided vitreous material from said hollow area and feed such material into said cage means, and

(g) a means for supplying finely divided vitreous material to the hollow portion of said impeller.

4,532,886

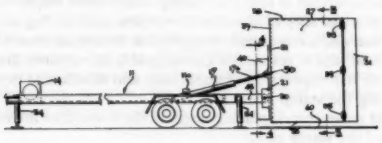
PORTABLE PAINTING ASSEMBLY

Roland D. Bouchard, 15419 Doty Ave., Lawndale, Calif. 90260

Filed Aug. 15, 1984, Ser. No. 641,066

Int. Cl.³ B05B *1/28, 15/04*

U.S. Cl. 118—326 **7 Claims**



1. A portable painting assembly for use in painting an object standing on support means comprising,

a booth having an open bottom and forming an enclosure on at least three sides;

mobile means for supporting and transporting said booth and,

means for driving said booth between a first position supported on said mobile means for transportation and a second position wherein said booth is suspended from said mobile means over the object to be painted but separated from the support means on which said object is standing, said means for driving said booth comprising drive means having drive rods, said drive means being pivotally supported on said mobile means with the drive rods thereof pivotally connected to said booth, and means for pivotally supporting said booth on said mobile means.

4,532,887

LIFE EXTENSION OF CATALYST PREDIP BATHS

Robert B. Forsterling, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

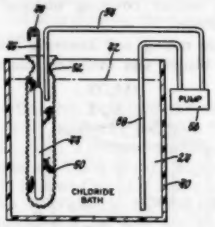
Division of Ser. No. 490,313, May 2, 1983, Pat. No. 4,481,231.

This application Jun. 21, 1984, Ser. No. 623,011

Int. Cl.³ C23C *3/02*

U.S. Cl. 118—429 **1 Claim**

1. In an apparatus for electrolessly depositing copper, which apparatus serially includes a tank containing an acidic chloride activator dip protective solution and a following tank containing a stannous chloride activator dip that precedes a tank containing an electroless copper plating bath, the improvement wherein the first-mentioned tank includes means for extending the useful life of the acidic chloride solution in protecting the activator dip bath prior to electroless copper plating, said life extension means including a metallic tin rod supported within the tank without connection to means for applying an electrical potential to the rod, effective to provide a chemical reaction between the metallic tin rod and undesired copper ions introduced into the first-mentioned tank, a filter bag enclosing



the tin rod that entraps chemical reaction products of the undesired copper ions and the metallic tin rod but allows tin ions to pass through, and pump means for recirculating solution from the first-mentioned tank into the filter bag, whereby the undesired copper ions in the acidic chloride solution will precipitate and be trapped within the bag and replaced in the acidic chloride solution by tin ions, so as to permit the acidic chloride solution tank to have an extended useful life in protecting the stannous chloride activator dip tank.

4,532,888

ELECTRON-BEAM COATING OF VERY BROAD STRIPS

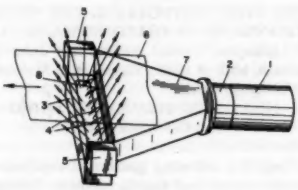
Manfred Neumann; Henry Morgner; Harry Förster; Günter Jäsch; Wilfried Kunack; Martin Godenschweg, and Peter Ungänz, all of Dresden, German Democratic Rep., assignors to Bakish Materials Corp., Englewood, N.J.

Filed Jul. 29, 1983, Ser. No. 518,473

Claims priority, application German Democratic Rep., Aug. 3, 1982, 2422022

Int. Cl.³ C23C *13/12*

U.S. Cl. 118—718 **7 Claims**



1. Apparatus for electron-beam coating of broad strips comprising:

an elongated evaporation crucible;

means for transporting strip to be coated over said crucible in a direction normal to the long side thereof;

an electron gun above said crucible and spaced from said long side;

a first beam deflection system for spreading said beam;

a vacuum-tight beam shielding mantle extending from said first deflection means to said crucible;

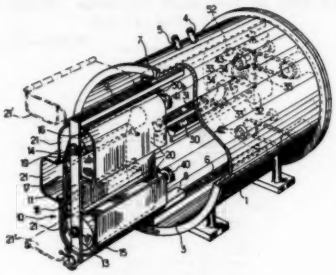
a second beam deflection system for deflecting a beam emergent from said mantle downward into said crucible;

said mantle extending to the path of material vaporized from said crucible, so that the outlet of it is closed by the vapor stream.

4,532,889
PROCESS AND APPARATUS FOR METALLIC IMPREGNATION OF A WEB OF CONDUCTIVE FIBRES

René L. Coffy, Sausset-les-Pins, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 5, 1984, Ser. No. 627,713
Claims priority, application France, Jul. 7, 1983, 83 11336
Int. Cl.³ C23C *13/08, 13/10*
U.S. Cl. 118—718 9 Claims



1. An apparatus for implementing a process for the metallic impregnation of a substrate that is in the form of a web of conductive fibers, characterised in that it comprises:

a chamber which is provided with means for closing it so that it is airtight and into which there run a duct for evacuating the chamber and a pipe supplying an inert gas to it,

a device for supporting the substrate comprising a carriage that can move between a first position inside the chamber and a second position outside the chamber through an aperture closed by the closing means, and comprising means for guiding the carriage with respect to the chamber when it moves from one of the positions towards the other, the said carriage being provided with means for rotatably accommodating a reel of web to be unwound and a reel for rewinding this web, the reels being spaced one from the other, and means for guiding the said web extending between the reels in a running plane which is fixed with respect to the carriage and is substantially parallel to the line of its displacement,

at least one crucible for receiving the molten metal, which crucible is mounted on the said chamber and inside it and is located substantially parallel to and adjacent the running plane of the web when the carriage is in its first position,

means for the electrical insulation of the said reels with respect to the said carriage, and

electrical contact means enabling the said reels to be connected to a source of potential when the carriage is in its first position.

4,532,890
PET LITTER

Tomio Ohki, and Toshio Yoshioka, both of Yokohama, Japan, assignors to Nippon Pet Food Company, Ltd., Japan

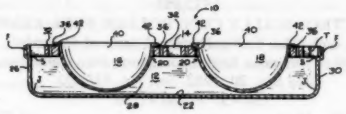
Filed Mar. 27, 1984, Ser. No. 593,811
Claims priority, application Japan, Apr. 5, 1983, 58-59752
Int. Cl.³ A01K *1/015*
U.S. Cl. 119—1 6 Claims

1. A process for the preparation of a pet litter, which process comprises adding to a chopped paper material for mixing, water and a ground product or pellets with a high content of chlorophyll selected from the group consisting of alfalfa grass, stems and leaves of ipil ipil niseacacia, and Spirulina scenedesmus in an amount of from 1 to 70% by weight based on the amount of the chopped paper material, pelletizing the resulting mixture and drying the resulting molded product.

4,532,891
PET FEEDER ASSEMBLY

Richard O. Jones, 1306 Frontera, Millbrae, Calif. 94030

Continuation-in-part of Ser. No. 538,164, Oct. 3, 1983, abandoned. This application Feb. 13, 1984, Ser. No. 579,705
Int. Cl.³ A01K *5/00*
U.S. Cl. 119—51 FS 6 Claims



1. A pet feeder assembly comprising:

an upwardly opening receptacle for receiving and retaining liquid and solid matter, said receptacle including a base portion and contiguous sidewall portions rising from said base portion, said sidewall portions being provided with shoulder means proximate an upper edge thereof; and

feeder means including

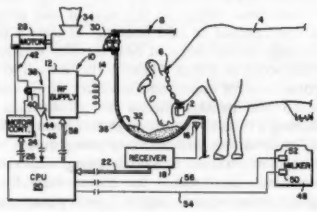
a rigid, self-supporting, frameless, substantially planar lattice portion engaged with said shoulder means of said sidewall portions so as to be supported over and substantially parallel to said base portion and said receptacle, said lattice portion having a plurality of crossing bar members attached together at their junctures and having interstitial spaces large enough to pass particulate matter at least ¾ inch across; and

a bowl portion supported by and extending downwardly from said lattice portion, said bowl portion having a rim surface which is substantially even with said lattice portion, and a bottom surface which is located a small distance above said base portion of said receptacle relative the depth of said bowl portion.

4,532,892
ANIMAL FEEDING AND MONITORING SYSTEM

James H. Kuzara, Sheridan, Wyo., assignor to Ralston Purina Company, St. Louis, Mo.

Division of Ser. No. 293,314, Aug. 17, 1981,. This application May 2, 1984, Ser. No. 606,132
Int. Cl.³ A01K *5/02*
U.S. Cl. 119—51 R 2 Claims



1. A system for feeding and monitoring a plurality of animals in a plurality of adjacent stalls comprising a plurality of electronic identity means for respectively identifying said plurality of animals, each of said plurality of electronic identity means including a power supply means for supplying operating power and a code generator means connected to receive operating power from said power supply means for generating a coded identifier signal uniquely associated with each said electronic identity means, a plurality of receivers respectively mounted in said plurality of adjacent stalls, each said receiver including a receiving circuit means for detecting said coded identifier signal whenever one of the animals carrying one of said electronic identity means enters the stall within which said

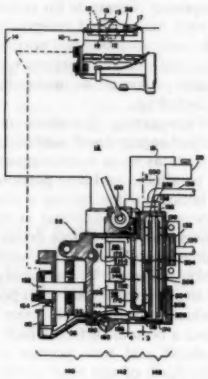
receiver is mounted, each said receiving circuit means having a means for decoding said coded identifier signal to produce a decoded identifier signal, a central control means connected to said plurality of receivers for receiving said decoded identifier signals therefrom and a multiplexer means connected between said central control means and said plurality of receivers for insuring that only one of said receivers is active at a time.

4,532,893

ELECTRONICALLY CONTROLLED FUEL PUMP

Eric Day, and Allen F. VanDerStuyf, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 30, 1982, Ser. No. 435,573
Int. Cl.³ F02M *41/02*
U.S. Cl. 123—41.31 **11 Claims**



1. In a fuel system for an internal combustion engine having injectors which meter fuel to said engine, a fuel pump comprising:

means for forming a housing;

engine driven pump means within said housing means, and having an inlet, for pressurizing fuel;

electronic control means mounted within said housing for generating an electrical signal as a function of selected control inputs, and

means for providing a passage for fuel through said housing from an external source to the inlet of said pump means and to the exterior of said housing, at least a portion of said passage means being in heat transfer relation to said electronic control means whereby fuel is used to cool said electronic control means and auxiliary pump means connected to said passage means for pressurizing fuel for establishing a flow of fuel through said passage means and means for actuating said auxiliary pump means whenever a selected temperature in said housing means exceeds a predetermined limit above the temperature that occurs during operation of said engine driven pump means irrespective of operation of said engine driven pump means.

4,532,894

HEATING ARRANGEMENT FOR ELECTRICALLY DRIVEN VEHICLES

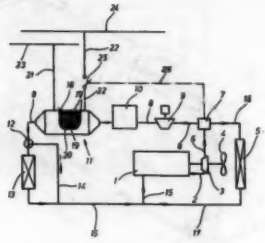
Helmut Wulf, Ostfildern, and Friedrich Baehrle, Kernen-Rommelshausen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1984, Ser. No. 595,307
Int. Cl.³ F02N *17/02*
U.S. Cl. 123—142.5 E **3 Claims**

1. In a dual-mode vehicle equipped to be powered by either an electrical power source or a water cooled internal combustion engine, the improvement comprising a heating system having:

electrical heat exchanger means powered by said electrical power source, said heat exchanger means including a continuous-flow heater connected to receive a through-flow of cooling water from said internal combustion engine;

an auxiliary fuel powered heater operable only when said vehicle is not powered by said electrical power source, said fuel powered heater being connected in series with



said continuous-flow heater to receive said flow of cooling water;

electric water pump means for circulating said flow of cooling water through said continuous flow heater and said fuel powered heater, said water pump means being operable at least during standing periods when said vehicle is not receiving power from said electrical power source and said internal combustion engine is not running; and

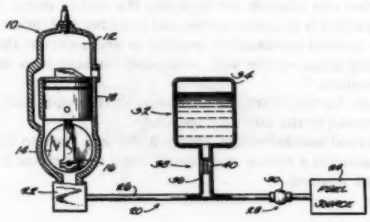
control means for energizing said continuous-flow heater when a cooling water temperature of said internal combustion engine reaches a pre-determined value.

4,532,895

PRIMER FOLLOW-THROUGH SYSTEM

Don F. Kueny, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 28, 1984, Ser. No. 583,685
Int. Cl.³ F02M *1/16*
U.S. Cl. 123—187.5 R **15 Claims**



1. A fuel supply system for an internal combustion engine including a combustion chamber, said fuel supply system comprising means for priming said internal combustion engine by supplying priming fuel from a fuel source to the combustion chamber, said priming means including a fuel line communicating with the fuel source and with the combustion chamber, and including selectively operable means for causing fuel flow in said fuel line, and means connected to said fuel line for automatic accumulation of fuel during fuel flow through said fuel line to the combustion chamber, and for automatic delivery, after discontinuance of fuel flow in said fuel line, of the accumulated fuel into said fuel line, said means connected to said fuel line comprising a fuel passage communicating with said fuel line, and a fuel reservoir which is permanently closed from

the atmosphere and which solely communicates with said fuel passage.

4,532,896

TWO-CYCLE ENGINE

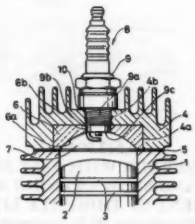
Kichio Nakahara; Hiroshi Matsui, and Harumichi Yoshiyama, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 17, 1983, Ser. No. 552,826

Claims priority, application Japan, Nov. 18, 1982, 57-202307

Int. Cl.³ F02B *75/08*

U.S. Cl. 123—193 H **1 Claim**



1. A cylinder head for a two-cycle engine comprising:

a cylinder head having an interior portion forming a combustion chamber, an opening in said head into said combustion chamber disposed to receive a spark plug, the inner surface of said combustion chamber adjacent said opening consisting essentially of a layer of sintered ceramic material selected from the group consisting of silicon nitride, zirconia, sialon, alumina and silicon carbide, wherein said layer has a thickness in the range from about 2 to 6 millimeters, said opening comprising an outer threaded portion and an inner unthreaded portion confined solely within said ceramic layer; and

a spark plug interposed within said opening, said spark plug having a tip comprised of an outer threaded portion, an inner unthreaded portion and electrodes, said unthreaded portion of said spark plug peripherally engaging said unthreaded portion of said opening within said ceramic layer.

4,532,897

INTERNAL COMBUSTION ENGINE FOR VEHICLES IN PARTICULAR, FOR MOTORCYCLES

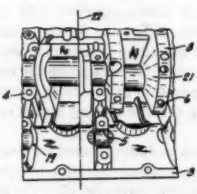
Hans Mezger, Freiberg, Fed. Rep. of Germany, assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.

Filed Jun. 11, 1984, Ser. No. 619,498

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1983, 3321751

Int. Cl.³ F01M *1/00*

U.S. Cl. 123—196 R **19 Claims**



1. In an internal combustion engine for motorcycles, said engine having a crankcase including an upper part and a lower part and a crankshaft mounted therebetween, said lower part including an oil space and an oil sump arranged at a lower level than said oil space, said crankshaft having crank webs mounted thereon which rotate partially in said lower part and said crankshaft being mounted in bearing seats having walls, the improvement comprising:

a curved shape floor in said lower part, said floor being spaced apart from the envelope sleeve defined by the paths of travel of said crank webs,

constricted oil return ducts in said floor disposed opposite said crank webs and in the paths of movement thereof, said ducts having a slope and extending between the walls of said bearing seats,

said ribs being disposed on said floor and said oil return ducts being formed between said ribs and said walls of said bearing seats.

4,532,898

FUEL INJECTION TYPE INTERNAL COMBUSTION ENGINE

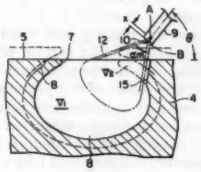
Kizo Hayakawa; Nobuyuki Mori; Yoshio Watanabe, and Kazumi Nakashima, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, both of, Japan

Filed Dec. 9, 1983, Ser. No. 559,886

Claims priority, application Japan, Dec. 13, 1982, 57-218112

Int. Cl.³ F01L *3/00;* **F02B** *3/04*

U.S. Cl. 123—276 **6 Claims**



1. A fuel injection type internal combustion engine comprising:

a cylinder body formed with a cylinder chamber;

a cylinder head mounted on said cylinder body;

a piston adapted to be reciprocated within said cylinder chamber and to define a combustion chamber between the top thereof and said cylinder head;

an injection nozzle mounted at a predetermined position in one of said cylinder head and said cylinder body for injecting fuel into said combustion chamber at a large spray diverging angle, said injection nozzle having its central axis inclined at a predetermined angle with respect to the top of said piston and its leading end portion facing said combustion chamber in a manner that its injection port is offset from the center of said cylinder chamber; and

said combustion chamber comprising a combustion chamber cavity opened in the top of said piston and an auxiliary cavity formed in the opening portion of said combustion chamber cavity, said auxiliary cavity being defined by a notched wall with surfaces shaped so that the auxiliary cavity has a minimum required volume and so that injected fuel is prevented from contacting said notched wall, the shape of the notched wall being determined by following the shape of the fuel injection pattern at the maximum spray diverging angle at each piston position while the piston travels during the fuel injection,

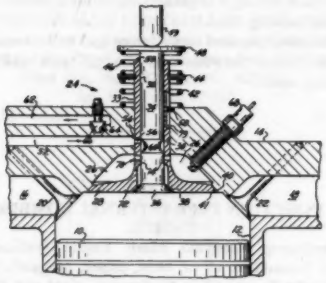
thereby allowing fuel to be injected at a large spray diverging angle through said auxiliary cavity without colliding against the wall of said combustion chamber while minimizing the decrease of the compression ratio of the engine.

4,532,899

INTERNAL COMBUSTION ENGINE FUEL-INJECTION SYSTEM

Anthony Lorts, 441 S. Brooke, Apartment C, Alpena, Mich. 49707

Filed Jun. 23, 1983, Ser. No. 506,983
Int. Cl.³ F02B 19/02
U.S. Cl. 123—292 8 Claims



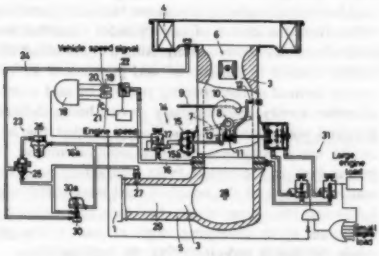
1. A fuel injection and combustion structure for an internal combustion engine having a cylinder, a cylinderhead and a piston reciprocable in said cylinder, said structure comprising a precombustion chamber formed in said cylinderhead, valve means for controllably placing said precombustion chamber in communication with said cylinder during a power stroke of said piston, an auxiliary chamber in said first valve means, second valve means for placing said auxiliary chamber in communication with said cylinder and for placing said chamber in communication with said precombustion chamber in the course of a compression stroke of said piston so as to introduce compressed air from said cylinder into said precombustion chamber, and means for injecting a measured amount of fuel in said compressed air passing from said auxiliary chamber to said precombustion chamber, wherein said first valve means comprises a first poppet valve having a longitudinal bore, said second valve means comprises a second poppet valve disposed concentric and reciprocable within said bore in said first poppet valve and said auxiliary chamber is formed by an enlarged end portion of said bore in said first poppet valve.

4,532,900

DECELERATION CONTROL APPARATUS FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yoshitaka Hibino, Kamifukuoka, and Syunzaburo Ozaki, Sakado, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1983, Ser. No. 477,667
Int. Cl.³ F02M 23/06
U.S. Cl. 123—327 6 Claims



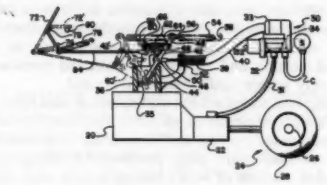
1. A deceleration control apparatus in a multi-cylinder engine, an intake passage including an intake manifold connected to respective cylinders of a multi-cylinder engine, said intake manifold including at least one diverging portion and a plurality of diverged passages downstream thereof, said apparatus comprising valve closing means for closing a throttle valve in the intake passage beyond an idling position thereof at the time of deceleration, and an air supply means for supplying secondary air to the intake passage, characterized in that the air supply means includes an air supply opening directly in only one of said diverged passages on the downstream side of said diverging portion of the intake manifold.

4,532,901

ENGINE GOVERNOR WITH FAST REFERENCE POSITIONING AND SLOW OPENING AND CLOSING MOVEMENT OF THROTTLE LIMITER

Harry D. Sturdy, Wilmington, N.C., assignor to Sturdy Truck Equipment, Inc., Wilmington, N.C.

Division of Ser. No. 471,904, Mar. 7, 1983, which is a continuation of Ser. No. 168,566, Jul. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 30,064, Jul. 4, 1979, abandoned. This application Nov. 18, 1983, Ser. No. 553,191
Int. Cl.³ F02D 31/00
U.S. Cl. 123—333 6 Claims



1. In an engine speed governor for an engine having a throttle movable between an open throttle position and a close throttle position for regulating the flow of fuel to the engine, said governor being of the type comprising an overriding throttle closing means, engine speed sensing means for producing a speed signal, and control means for moving the throttle closing means to a position for limiting the engine speed to a predetermined governed value, the improvement wherein said control means included:

actuating means including a reversible motor coupled with the overriding throttle closing means for driving it in the close throttle direction or the open throttle direction,

electronic circuit means coupled with said speed sensing means and with said motor for energizing the motor, said circuit means including means responsive to a predetermined speed signal for energizing the motor for relatively high speed operation in the close throttle direction until the overriding throttle closing means reaches a reference position,

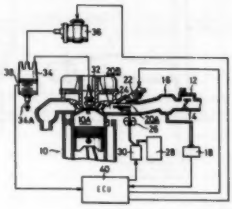
said circuit means including means for energizing the motor for relatively low speed operation in either the close throttle or open throttle direction after the overriding throttle closing means reaches said reference position,

said low speed operation of the motor being slower than the response capability of the engine to a change in flow of fuel to the engine whereby engine speed oscillations are minimized.

4,532,902
METHOD OF AND SYSTEM FOR CONTROLLING IGNITION TIMING IN INTERNAL COMBUSTION ENGINE

Hiroshi Mizuno, Toyota, and Hiroshi Ito, Nagoya, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1984, Ser. No. 606,967
Claims priority, application Japan, May 6, 1983, 58-79010
Int. Cl.³ F02P *1/00, 5/04;* **F02B** *31/00*
U.S. Cl. 123—417 **6 Claims**



1. A method for controlling ignition timing in an internal combustion engine having a throttle valve and an intake air control valve independent of said throttle valve, in which the ignition timing is controlled in synchronism with the operation of the intake air control valve, comprising:

determining whether or not there exist conditions where said intake air control valve is to be on-off operated;

controlling the operation of said intake air control valve when it is determined there exists a condition where said intake air control valve is to be on-off operated;

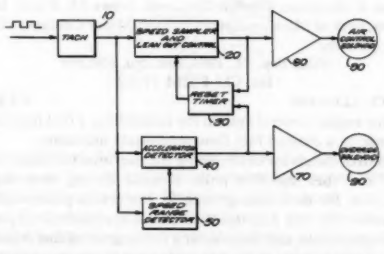
delaying a change in the timing of the ignition timing by a predetermined period of time corresponding to a delay time in effecting the on-off operation of said intake air control valve; and

changing the ignition timing in accordance with the on-off condition of said intake air control valve upon the end of said predetermined period of time.

4,532,903
BINARY AND PROPORTIONAL CONTROL FOR A FEEDBACK CARBURETOR

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Mar. 14, 1984, Ser. No. 589,235
Int. Cl.³ F02P *5/04;* **F02B** *33/00*
U.S. Cl. 123—436 **4 Claims**

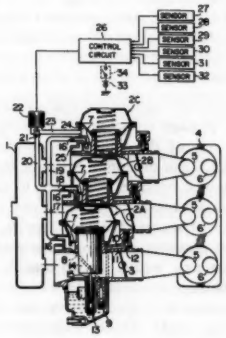


1. In an internal combustion engine, subject to rapid variations in the RPM rate of change, wherein a combustible air/fuel mixture is introduced into combustion chambers of the engine with the air/fuel ratio of the mixture being controlled by feedback carburetor means having associated therewith a fuel bowl to which a controlled vacuum is applied to control the fuel flow rate, the improvement comprising; means for generating an analog signal indicative of engine RPM, means responsive to said analog signal for determining a steady state RPM for said internal combustion engine, means responsive to operation of said engine at said steady state RPM for applying said vacuum to said fuel bowl at a fixed and predetermined controlled rate until a predetermined decrease in said engine RPM has been achieved, regardless of time duration required to achieve said predetermined decrease, means for indicating said predetermined decrease in engine RPM and means responsive to said predetermined decrease in engine RPM for reducing said vacuum applied to said fuel bowl, wherein there is further included means for timing a predetermined interval during which said vacuum applied to said fuel bowl is reduced and means responsive to the expiration of said predetermined interval for reapplying said vacuum to said fuel bowl.

4,532,904
AIR-FUEL RATIO CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES

Tadao Ōsawa, Katsuta; Toru Nakagawa, Mito; Masamitsu Okumura, Katsuta; Takashige Kohno, and Tokihiko Sakuma, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,182
Claims priority, application Japan, Feb. 17, 1982, 57-22645
Int. Cl.³ F02M *13/02*
U.S. Cl. 123—439 **2 Claims**



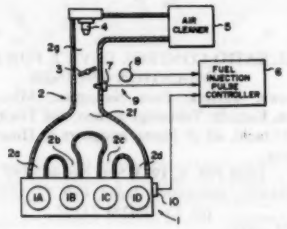
1. An air-fuel ratio control device for an internal combustion engine which controls the flow rate of air supplied to a plurality of variable venturi type carburetors with each of the carburetors having a slow system for controlling the air-fuel ratio to set the same at an optimum value in dependence upon operating conditions of the engine, the control device comprising a plurality of sensor means for sensing engine parameters including intake vacuum, engine oil temperature, intake air temperature and atmospheric pressure relating to operating characteristics of the engine, a control circuit means for receiving output signals from said sensor means and a signal indicative of a rotational speed of the engine as its inputs, and at least one solenoid valve means for controlling the flow rate of air flowing through air passages of said slow systems, said solenoid valve means being actuated by a current having an optimum duty ratio computed by said control circuit means in dependence upon the output signals from said sensor means and said rotational speed signal, and wherein the at least one solenoid valve means is associated with an upstream end of an air passage communicating at a downstream end with all upstream ends of slow air bleeds in the individual slow systems of said plurality of carburetors.

4,532,905

FUEL INJECTION CONTROL SYSTEM FOR CONTROLLING THE FUEL DISTRIBUTION TO THE CYLINDERS OF A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Katsuhiko Yokooku; Tadashi Kaneko, and Tadataka Nakazumi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Feb. 23, 1984, Ser. No. 582,771
Claims priority, application Japan, Feb. 24, 1983, 58-29989
Int. Cl.³ F02M 51/00
U.S. Cl. 123—443 14 Claims



1. A fuel injection system for four-cylinder engines having an air intake passage consisting of a collective passage, the downstream end of the collective passage forming a first branch-off part; a pair of branch passages, the upstream ends of said pair of branch passages connected to said first branch-off part and the downstream ends of said pair of branch passages forming a pair of second branch-off parts; and two pairs of second branch passages, each pair of second branch passages extending from a respective second branch-off part, each second branch passage connected to a respective cylinder, the cylinders connected to a respective pair of second branch passages having intake strokes adjacent to each other; said system comprising:

a fuel injection valve provided in said collective passage;

an intake air flow detecting means for detecting the amount of intake air flow into said cylinders and generating a signal representative thereof;

a standard signal generating means for generating standard signals synchronized with rotation of the engine;

a fuel injection pulse control means, which receives signals from said intake air flow detecting means and said standard signal generating means, for forwarding to said fuel injection valve fuel injection pulses of a pulse duration proportional to said intake air flow to said cylinders in the intake stroke thereof at a predetermined timing determined by said standard signals; and

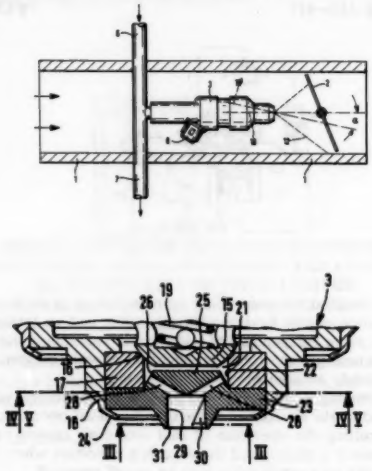
and an injection timing correction means for correcting said predetermined timing for one cylinder of each pair of cylinders connected to the same second branch-off part when said intake air flow is lower than a predetermined value and correcting said predetermined timing of the other cylinder of each pair of cylinders connected to the same second branch-off part when said intake air flow is higher than said predetermined value, the intake stroke of said one cylinder of each pair of cylinders being preceded by that of a cylinder of the other pair of cylinders.

4,532,906

FUEL SUPPLY SYSTEM

Rainer Höppel, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,763
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229716
Int. Cl.³ F02M 55/02
U.S. Cl. 123—470 6 Claims



1. A fuel supply system for internal combustion engines comprising an intake tube having a longitudinal axis, a throttle device in said intake tube, a fuel delivery element supported in said intake tube upstream of said throttle device such that incoming air surrounds said fuel delivery element, said fuel delivery element including injection means arranged to eject fuel asymmetrically toward said throttle device, said injection means including swirl means, said swirl means further provided with means defining apertures arranged to communicate with a swirl chamber and guide means in said swirl chamber adapted to partially divert said fuel stream downstream of said apertures.

4,532,907

SELECTIVE SINGLE FIRE/DOUBLE FIRE FUEL INJECTION CONTROL

Arthur J. Buglione, Garden City, and James M. Coats, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

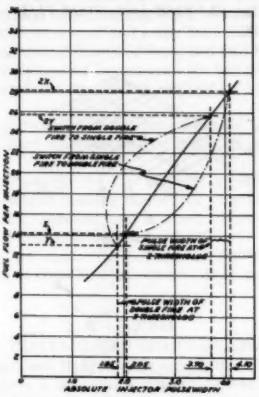
Filed Sep. 14, 1984, Ser. No. 650,399
Int. Cl.³ F02M 51/02
U.S. Cl. 123—490 5 Claims

1. An engine control system for controlling a fuel injector in response to a desired fuel flow magnitude including:

a control means for determining the fuel injector pulse width if one fuel injection pulse is made during each engine cycle; for determining each fuel injection pulse width if more than one fuel injection pulses are made during each engine cycle; and for selecting the number of fuel injection pulses during each engine cycle so as to provide operation of the fuel injector in an advantageously linear portion of a fuel injector characteristic curve relating injection pulse width to injector fuel flow rate; and

said control means being adapted to operate the fuel injector in a first mode with one fuel injection per engine cycle and to operate the fuel injector in a second mode with two fuel

injections per engine cycle, having a hysteresis effect so that a first threshold of fuel injected during an engine cycle for switching from the first mode to the second



mode is different from a second threshold of fuel injectd during an engine cycle for switching from the second mode to the first mode.

4,532,908

CONTROL DEVICE FOR METERING FUEL IN A SUPERCHARGED INTERNAL COMBUSTION ENGINE

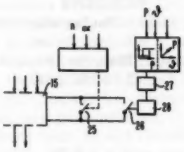
Ulrich Steinbrenner, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1983, Ser. No. 509,092

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235346

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—493 **14 Claims**



1. A control device including means for controlling the metering of fuel in an internal combustion engine operated with supercharging and dependent, for instance, upon aspirated air quantity, rpm, air temperature and throttle valve position, comprising a first switching means connected to said controlling means for reducing the supply of fuel during overrunning, and a second switching means connected in parallel with said first switching means and responsive to charge pressures above a predetermined charge pressure for reducing the supply of fuel, whereby overrunning the supply of fuel is reduced during at least one of the following conditions: overruning and excessive charge pressures.

4,532,909

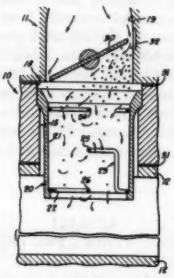
BUTTERFLY CARBURETION SYSTEM

Maurus E. Jackson, 1207 S. Flower St., Burbank, Calif. 91505

Continuation of Ser. No. 388,012, Jun. 14, 1982, abandoned, which is a continuation of Ser. No. 151,731, May 20, 1980, abandoned. This application Mar. 26, 1984, Ser. No. 593,497

Int. Cl.³ F02M *29/00*

U.S. Cl. 123—590 **18 Claims**



1. That improvement in the fuel supply system of a vehicle engine equipped with a butterfly regulated carburetor which comprises:

a riser plate device having upper and lower surfaces constructed for retrofit installation clamped between the fuel and air outlet of the engine's existing carburetor and the inlet of the engine's existing intake manifold for operation completely isolated from the engine's exhaust manifold;

said riser plate having a thickness approaching the diameter of said carburetor outlet and a non-perforated smooth-surfaced primary fuel and air mixing passage therethrough with the entrance thereof adjacent said upper surface of said riser plate;

said fuel and air mixing passage having smoothly merging first and second converging portions between the opposite ends thereof, said first portion being relatively short and obtusely tapering toward the adjacent end of said second portion, and said second portion being relatively long and slightly tapering toward the outlet end of said mixing passage and cooperating with said first portion to limit air flow therethrough of the order of 60% to 90% of the air flow which would occur through said carburetor without said riser plate device.

4,532,910

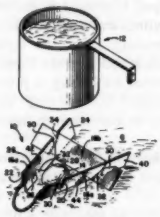
PORTABLE, KNOCKDOWN FIELD STOVE

James B. Longley, Jr., P.O. Box 1230, 671 Main St., Lewiston, Me. 04240

Filed Sep. 20, 1984, Ser. No. 652,270

Int. Cl.³ F24C *1/16*

U.S. Cl. 126—9 B **7 Claims**



1. A portable, knockdown field stove for supporting a cooking utensil above a portable heat source comprising:

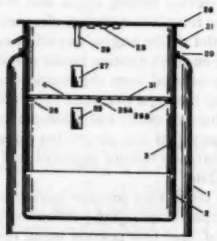
a plurality of interlockable elongated plate means for enclosing and supporting the portable heat source above ground, interlocking and ventilating means in each plate means for disengagably interlocking said each plate means to another plate means and defining a vent at the location of interlocking to provide a predetermined amount of ventilation to and from the portable heat source to support and sustain a predetermined rate of combustion of the portable heat source, said interlocking and ventilating means further including triangular notch means defined in each plate means to extend inwardly from a side edge of said each plate means for causing each plate means to tilt with respect to another plate means interlocked therewith so interlocked plate means converge toward each other and toward the ground at an angle for supporting said portable heat source on said plate means above the ground and for resolving forces generated by the weight of the cooking utensil in a manner which increases interlocking forces of said stove.

4,532,911

HEAT CONTROLLING COOKER

Ralph H. Orter, P.O. Box 2074, Prescott, Ariz. 86302

Continuation of Ser. No. 258,471, Apr. 23, 1981, abandoned.
This application Jan. 17, 1983, Ser. No. 458,658
Int. Cl.³ A47J *37/00*; F24B *3/00*
U.S. Cl. 126—27 **1 Claim**



1. A cooker for, use with a stove top burner or heating element heat source comprising;

a cylindrical base, including a cylindrical wall, an open bottom, and open top, the area of the bottom being sized to fit over and encircle the heat source;

a cylindrical vessel, including a cylindrical wall, a closed bottom, an open top and a plurality of handles located adjacent the open top and a band extending around the wall and located below the handles, the cylindrical wall including a plurality of vertically spaced aperatures, the area of the bottom being less than the area of the open top of the cylindrical base such that the cylindrical vessel is received within the open top of the cylindrical base, with the band of the vessel supported on the edge of the open top of the cylindrical wall of the base;

and a cylindrical insert including a cylindrical wall, an open top and an open bottom and including a band extending around the cylindrical wall at the open top, a plurality of supports extending from the cylindrical wall into the cylinder interior and a grate supported on the supports, the insert further including a plurality of vertically disposed aperatures, the spacing between the aperatures corresponding to the spacing between the aperatures of the vessel,

the area of the bottom of the insert being less than the area of the container top such that the insert is received in the vessel;

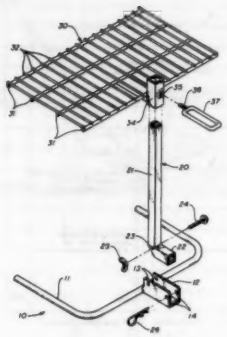
whereby, the insert is rotatable within the vessel, to adjust the overlap between the aperatures and to thereby control the quantity of heated air from the heat source entering the insert.

4,532,912

PORTABLE COOKING APPARATUS

Royal D. Burnside, III, 6427½ E. Wallisville Rd., Baytown, Tex. 77520

Filed Apr. 12, 1984, Ser. No. 599,588
Int. Cl.³ F24B *3/00*; F16M *11/38*
U.S. Cl. 126—30 **12 Claims**



1. Portable apparatus for cooking over a fire or other concentrated source of cooking heat comprising:

a support base for supporting said apparatus generally above said first or other source of heat;

a support column attached to said support base for pivoting movement from a first position, generally next to said support base, to a second position extending upwardly from said base; and

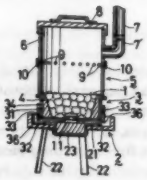
a grill member for attachment to said support column, when in said second position, for supporting said grill member above said first or other source of heat, said grill member being removable from said support column to permit said support member to be moved to said first position, said support column being provided near the base thereof with a relatively short arm extension substantially perpendicular thereto which, when said support column is in said first position, extends upwardly from said base for attachment of said grill member thereto to store said grill member in a position adjacent said base member.

4,532,913

COMBUSTION MEANS FOR SOLID FUEL OF LOW ASH CONTENT

Daihachiro Murase, 11-12 Mitsukeyama 1-chome, Ibaraki-shi, Osaka-fu, Japan

Filed Nov. 7, 1983, Ser. No. 549,544
Int. Cl.³ F24C *1/00*
U.S. Cl. 126—58 **15 Claims**



1. A combustion means for solid fuels of low ash content, comprising:

a holding board for holding solid fuels of low ash content, said board being free of grooves and slits and having, on

its upper surface, a heat-insulating and heat-retaining layer made of a heat-resistant material;

a cylindrical body defining a combustion chamber therewithin, said cylindrical body being removably mounted on said holding board and mounted above said heat-insulating and heat-retaining layer on said holding board for movement toward and away from said layer and said board and spaced from said layer and said board to define an air intake space therebetween the size of which can be freely regulated by said movement of said cylindrical body;

a further heat-insulating and heat-retaining layer made of a heat-resistant material on the inside of said cylindrical body;

a drum portion on the top of said cylindrical body and having an inlet opening therein for supplying fuel to said combustion chamber and a cover removably mounted over said inlet opening; and

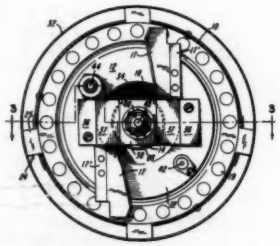
a chimney on said drum portion for discharging gaseous products of combustion from said drum portion.

4,532,914

PORTABLE LP SPACE HEATER

David Thomas, and Eugene C. Briggs, both of Bowling Green, Ky., assignors to Koehring Company, Brookfield, Wis.

Filed Dec. 2, 1983, Ser. No. 557,201
Int. Cl.³ F24H *3/02*
U.S. Cl. 126—110 C **23 Claims**



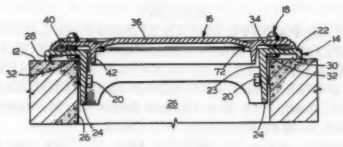
1. Heater apparatus particularly advantageous for use in providing an LP gas burning portable heater comprising means defining a combustion chamber having an inlet end and a discharge end, said inlet end being defined by plate structure having an inlet opening for the delivery therethrough of the primary air required for support of combustion within said chamber, a nozzle having means for connection thereof to and to discharge therefrom a supply of fuel, said means to discharge fuel providing for exit of the fuel from a portion of said nozzle which is projected inwardly of said primary air inlet opening to said chamber, means for igniting fuel delivered to said chamber in the presence of said primary air, means upstream of said plate structure for producing a flow thereto of air under pressure, said plate structure having therein a group of apertures defining inlets to said chamber for secondary air, said apertures being located within and adjacent the outer peripheral limit of said chamber, arranged in a single substantially ring-like pattern, the portion of said plate structure defining the inlet end of said chamber being essentially free of air inlets between said primary air inlet opening and said single ring-like pattern of apertures, said means to deliver a pressured flow of air being arranged to direct air to and through said primary air inlet opening and secondary air inlet apertures, means defining a surface within said chamber immediately of and transverse to said nozzle, in a closely adjacent relation to the fuel dis- charged therefrom and in line with said primary air inlet opening, said primary air, in the delivery thereof through said primary air inlet opening, passing immediately of said nozzle to intersect fuel exiting from said nozzle substantially immediately of said transverse surface to carry the fuel therewith as it impacts on said transverse surface to produce a turbulent intermixture of said air and fuel and a spread thereof laterally to move out of the outer peripheral limit of said transverse surface for a substantially instant ignition thereof immediately adjacent the outer peripheral limit of said transverse surface, and said single substantially ring-like arrangement of secondary air inlet apertures being arranged to provide a directed flow of secondary air passing to and through said chamber substantially encircling and containing the intermixture of air and fuel at ignition and the products thereof.

4,532,915

GAS TIGHT CHIMNEY ACCESS DOOR AND SHIELD FOR USE THEREWITH AND CHIMNEY ASSEMBLIES EMPLOYING SAME

Abbott B. de Rham, Stoney Meadow, Dorset, Vt. 05251

Filed Jun. 3, 1983, Ser. No. 500,639
Int. Cl.³ F23J *13/08*
U.S. Cl. 126—242 **10 Claims**



1. A chimney access door assembly for mounting in a chimney opening for convenient cleaning thereof comprising:

A. a frame member defining an aperture therewithin, said frame member having a face portion for disposition against the outer surface of the chimney and a mounting portion extending generally perpendicularly thereto for disposition against the side surfaces of the chimney opening, said mounting portion being of a length less than the thickness of the wall of the chimney;

B. fastener means in said mounting portion extending generally perpendicularly therethrough for mounting said frame member in an associated chimney opening by engagement in the chimney wall defining the opening;

C. a closure member dimensioned to close said aperture of said frame member and to overly at least the marginal portion of said face portion extending about said aperture;

D. gasket means between the opposed surfaces of said closure member and frame member face portion and extending about said frame member aperture; and

E. disengageable threaded fastening means on said closure member and said face portion of said frame member about said aperture for fastening said closure member securely to said frame face portion of said member about said aperture.

4,532,916

LINEAR CONCENTRATING SOLAR COLLECTOR

Naaman B. Aharon, P.O.B. 1016, Beer Sheva 84110, Israel

Filed Mar. 8, 1983, Ser. No. 473,203
Claims priority, application Israel, Mar. 14, 1982, 65238
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—424 **5 Claims**

1. A segment of a linear concentrating solar collector comprising:

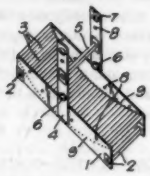
two plates spaced apart a predetermined distance with respect to each other and extending substantially in parallel relative to each other;

a connecting member operatively retaining said plates in said spaced apart relationship;

a plurality of holes positioned in each of said plates for defining a shape of a parabolic curve;

a plurality of reflective strips being operatively positioned between said plates and being disposed adjacent to each other to extend along said parabolic curve;

an absorber being operatively positioned at substantially an axial focal line of said parabolic curve;



adjustment means for individually adjusting each of said reflective strips for linearly focusing incident solar rays to coincide with said focal line of said absorber.

4,532,917

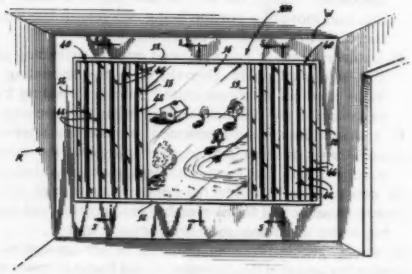
MODULAR PASSIVE SOLAR ENERGY HEATING UNIT EMPLOYING PHASE CHANGE HEAT STORAGE MATERIAL WHICH IS CLEARLY TRANSPARENT WHEN IN ITS HIGH-STORED-ENERGY LIQUID STATE

Douglas C. Taff, P.O. Box 85, and Robert B. Holdridge, P.O. Box 167, both of Hinesburg, Vt. 05461

Continuation of Ser. No. 562,715, Dec. 19, 1983, abandoned, which is a continuation-in-part of Ser. No. 444,607, Nov. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 226,395, Jan. 19, 1981, abandoned. This application Sep. 24, 1984, Ser. No. 653,923

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—430 **27 Claims**



1. A modular passive solar energy heating and outdoors viewing unit adapted to absorb and store solar energy and subsequently release said solar energy as thermal energy in an enclosed space comprising:

a fluid-tight rigid container member having two opposite surface areas clearly optically transparent and adapted to receive solar energy,

solar energy heat storage phase change material disposed in said container, said phase change material being polyethylene glycol characterized by a heat of fusion of about 33 to 37 ca./gm (4,170 to 4,670 Btu's per cubic ft.), a melting point of from about 13° to 25° C. (55° to 77° F.) and a specific gravity of approximately 1.125 at 20° C.,

said phase change material in said fluid-tight container member being translucent milky white when in its low-stored-energy solid state and being clearly optically transparent to visible light when in its high-stored-energy liquid state for enabling a viewer to look through said container member,

clearly optically transparent glazing in sheet form having an inner and an outer side, said transparent glazing being separated from said fluid-tight container member, and being positioned so as to permit solar radiation to pass through the glazing to a transparent surface area of the fluid-tight container member, the outer side of said glazing being disposed to face incoming solar radiation, said inner side of said glazing facing toward said transparent surface area of the fluid-tight container member, said inner side of the glazing being separated from said transparent surface area of the fluid-tight container member by a gas space,

said glazing transmitting short wavelength solar and visible light rays while preventing longer wavelength heat rays from radiating through the glazing,

said glazing being positioned on the opposite side of said fluid-tight container member from said enclosed space,

whereby when said phase change material is in its low-stored-energy solid state said fluid-tight container member presents a back-illuminated milky white appearance to a viewer in said enclosed space, and

whereby when said phase change material is in its high-stored-energy liquid state a viewer can see through said fluid-tight container and through said glazing.

4,532,918

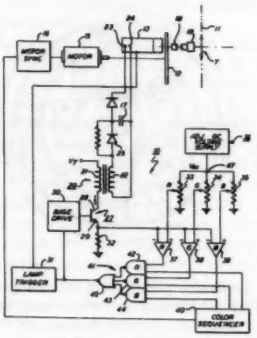
ENDOSCOPE SIGNAL LEVEL CONTROL

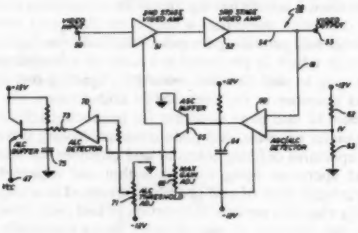
Robert C. Wheeler, Skaneateles, N.Y., assignor to Welch Allyn Inc., Skaneateles Falls, N.Y.

Filed Oct. 7, 1983, Ser. No. 540,138

Int. Cl.³ A61B *1/04*

U.S. Cl. 128—6 **7 Claims**





1. In a video endoscope having a solid state image sensor located in the viewing head of an instrument for recording light images of a target and clocking out the image data in the form of a video signal, a video signal level control apparatus that includes

a lamp for illuminating a target in the viewing range of the image sensor whereby image data of the target recorded by the sensor is clocked out as a video signal,

a color wheel for passing a series of different color filters in series through the illumination beam of the lamp in syn-

chronism with each video field to image the target sequentially with light of each different color in synchronism with each said field,

lamp driver means having an individual lamp amplitude control for regulating the illumination intensity of the lamp during each color imaging sequence, each lamp amplitude control having an adjustable voltage divider for connecting the lamp to a common voltage supply so that the color intensity of the images recorded by the sensor during a field can be proportionally balanced,

detector means for sensing the level of the video signals clocked out of the image sensor and providing a variable output signal indicative of the video signal level, and

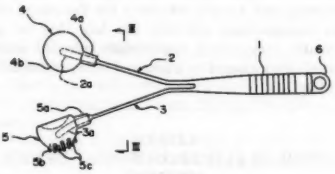
adjusting means for automatically regulating the common supply voltage to the lamp amplitude controls in response to the said variable output signal of the detector means to maintain the video signal at a desired level without disturbing the balance of the recorded color images.

4,532,919

SHOULDER PATTING MEANS

Shoji Iwahashi, and Ken Nakai, both of Kainan, Japan, assignors to Aisen Kogyo, Ltd., Wakayama, Japan

Filed Jun. 23, 1982, Ser. No. 391,269
Int. Cl.³ A61N *23/00*
U.S. Cl. 128—54 **3 Claims**



1. A shoulder patting means comprising:

a grip stick having one free end;

first and second resilient plates having substantially the same length and width extending from one end of said grip stick forming a one-piece, integral construction therewith and spaced from each other to form a Y-shape with said resilient plates normally diverging from each other in a direction away from said grip stick, said resilient plates being disposed in spaced relation with their width perpendicular to a swing direction of said grip stick, first and second tip members respectively secured to respective ends of said first and second resilient plates;

said first tip member formed of a truncated sphere with upper and lower portions, said upper portion being truncated with an upper surface parallel with said length of said first resilient plate and provided with a concave depression within said sphere for reception therein intermittently of said second tip member, said lower portion of said first tip member comprising substantially a hemisphere serving as a shoulder contacting surface when in use,

said second tip member having a substantially spherical configuration with a radius of curvature providing a complemental mating surface to that of said concave depression in said first tip member, both of said tip members being formed of an elastic material, said second tip member having a softer surface than that of said first tip member;

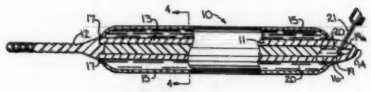
whereby a vibratory beating effect is conveyed to a user's body when said grip stick is swung in a direction such that the width of said first and second resilient plates are parallel with the user's body.

4,532,920

PENILE IMPLANT

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 150,231, May 15, 1980, Pat. No. 4,318,396, and a continuation-in-part of Ser. No. 266,455, May 22, 1981, abandoned, and a continuation-in-part of Ser. No. 328,827, Dec. 9, 1981, Pat. No. 4,411,261. This application Mar. 24, 1983, Ser. No. 478,449
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—79 **5 Claims**



1. A rod-type penile implant which can be implanted completely within a corpus cavernosum of a penis and used to incrementally increase the girth of said penis, said implant consisting of:

(a) an elongated rod-like member of physiologically inert material having a relatively short proximal stem portion adapted to be inserted into the root end of the corpus cavernosum of a penis, and a longer distal portion with a tip adapted to be implanted in the corpus cavernosum of the pendulous penis;

(b) an integral sleeve axially positioned about an intermediate section of the distal portion of said member and sealed at each end to the member to form an elongated chamber for pressurizing fluid; and

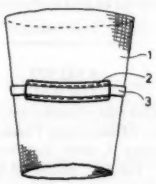
(c) a self-sealing valve means in said member rod-like and communicating with said chamber whereby pressurizing fluid can be added by means of a body piercing conduit to said chamber from the outside with a catheter so as to incrementally increase the size of said chamber and the girth of a penis in which it is implanted.

4,532,921

KNEE JOINT BANDAGE

Detlef von Torklus, Jungfrauenthal 20; Oskar Thum, Bebelallee 116, and Friedrich Wilharm, Martinistrasse, all of Hamburg, Fed. Rep. of Germany

Filed May 8, 1981, Ser. No. 261,711
Int. Cl.³ A61F *5/00*
U.S. Cl. 128—80 C **12 Claims**



1. A knee joint bandage, comprising a downwardly decreasing knee hose element composed of an elastic material and having a front side and a central region of its height; a supporting element connectable with said hose element at said front side and in said central region of the height of said hose element, said supporting element having a central supporting portion which is bent downwardly in correspondence with the user's knee disk so that upon putting the bandage on the user's leg said supporting portion abuts against the user's knee disk from below and thereby supports the user's knee disk from below; and means for connecting said supporting element with

said hose element to effect support of the user's disk from below.

4,532,922

DEVICES AND METHOD FOR CORRECT APPLICATION OF PLASTER DRESSINGS TO TREAT FRACTURES AND DISLOCATIONS

Vladimir Golyakhovsky, 165 W. 91st St., New York, N.Y. 10024

Filed Mar. 5, 1984, Ser. No. 586,287

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—91 R **8 Claims**

1. A device for correctly applying a plaster dressing to treat a fracture or dislocation of a human body segment comprising,

(a) a split flexible plastic member normally urged into annular shape,

(b) said member having an outwardly turned peripheral edge for its entire extent and a skirt portion depending therefrom, the depth of said skirt portion being substantially uniform for the entire extent thereof,

(c) whereby said member is adapted to be placed on said body segment with said skirt portion in surrounding relation thereto and whereby said outwardly turned peripheral edge defines the limit of the plaster dressing,

(d) said member being removable from under the plaster dressing after said dressing has been applied to said segment and has been set, and

(e) said skirt portion being provided with cutouts so as to define a plurality of side by side scalloped sections for facilitating removal of said member from under the plaster dressing.

4,532,923

AIR BAG

Stephen D. Flynn, Oakville, Canada, assignor to D-Two Systems International Inc., Mississauga, Canada

Filed Aug. 2, 1983, Ser. No. 519,754

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—205.13 **1 Claim**

1. A manually operable resuscitator bag of one piece integral molded construction, formed of thermoplastic material, and comprising:

a generally elongated football shape, defining an enlarged center portion of maximum diameter, and two tapering end portions of progressively reducing diameter;

an opening at each end and inlet means at one said end, and outlet means at the other said end;

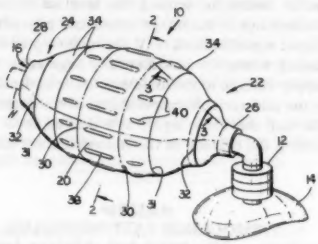
first fold-rings formed at about the transition from said centre portion to each of said tapering end portions, said first fold-rings comprising wall portions of reduced thickness and defining flex zones;

second fold-rings in each said tapering end portion comprising wall portions of reduced thickness, defining flex zones in said tapering end portions whereby said end portions may be telescoped, said second fold-rings being of reduced diameter relative to said first fold-rings;

ridges of thickened wall section between such fold-rings;

said centre portion having a wall thickness substantially equal to the thickness of said ridges in said tapering end portions between said rings;

a plurality of longitudinal ribs formed on the outer surface of



said centre portion at spaced intervals around the circumference thereof, and terminating short of said first fold-rings, and further reinforcing ribs formed in said two tapering end portions, said further ribs extending from said first to said second fold-rings, providing increased resiliency and a rapid recovery for the shape of the bag after compressing whereby the bag may be gradually manually compressed, and rapidly released without substantial delay caused by a delayed recovery of the shape of said bag.

4,532,924

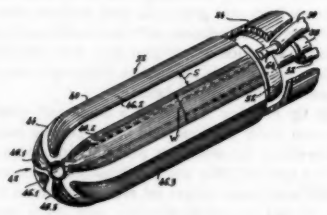
MULTIPOLAR ELECTROSURGICAL DEVICE AND METHOD

David C. Auth, Bellevue; Eric A. Opie, Seattle, and Dale M. Lawrence, Lynnwood, all of Wash., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 145,576, May 13, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,652

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.17 **25 Claims**



1. An electrosurgical device for use in the treatment of tissue comprising:

a multipolar probe body sized to enable passage of the probe body through an endoscope channel, said probe body having a peripheral surface and a longitudinal axis extending from a proximal to a distal end of the probe body;

at least one electrically isolated conductor pair mounted on the probe body including means for connecting the conductor pair to a source of electrical energy, each conductor comprising at least two electrodes with each electrode of one conductor being separated from and being interposed with another electrode of the other conductor with a spacing therebetween, said different electrodes being

further so distributed and respectively so sized in width and length so as to extend in spaced apart relationship over the distal end and over the peripheral surface side which is located radially from said longitudinal axis, the ratio of the width of electrodes to the spacing between the different electrodes being so selected as to enable effective bipolar treatment of tissue with effectively omni-directional probe body orientations relative to the tissue to be treated when the probe body is used.

4,532,925

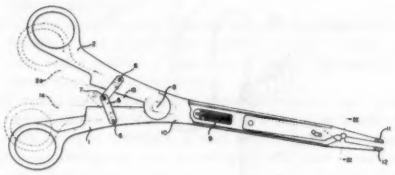
LIGATOR DEVICE

Joseph W. Blake, III, 88 Main St., New Canaan, Conn. 06840, assignor to Joseph W. Blake, III, New Canaan, Conn. and Jack W. Kaufman, Merrick, N.Y.

Continuation-in-part of Ser. No. 63,268, Aug. 2, 1979, Pat. No. 4,296,751. This application Oct. 20, 1981, Ser. No. 313,341

Int. Cl.³ A61B *17/12*

U.S. Cl. 128—325 **1 Claim**



1. A ligator device, comprising

a pair of handles;

a longitudinally movable center slide linked to said handles so as to move rearward when the handles are squeezed together;

a pair of jaws each slidably connected to a front portion of said center slide and each having a front end provided with an anvil;

means connecting said jaws to said center slide for said anvils to move together when said handles are squeezed and for said anvils to move apart when the handles are released;

a cartridge with a supply of ligating clips; and means for retracting all except the respectively leading clip located between said anvils, in direction rearwardly away from said anvils prior to movement of said anvils together,

said retracting means comprising a slot in one of said jaws and angled crosswise thereof in one direction, a slot in the other jaw and angled crosswise thereof in the opposite direction, and a pin integral with said front portion of said center slide and extending through said slots.

4,532,926

TWO-PIECE TISSUE FASTENER WITH RATCHET LEG STAPLE AND SEALABLE LATCHING RECEIVER

Robert H. O'Holla, Union, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jun. 20, 1983, Ser. No. 506,086

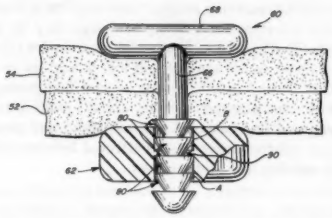
Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 C **6 Claims**

1. A fastener adapted to hold together two portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener being made from an absorbable polymer, said fastener comprising:

a fastening member including at least one leg with a distal end adapted to be passed through and project from said tissue portions, said fastening member also including a tissue clamp member connected to said leg and adapted to lie substantially against one of said tissue portions, said leg having on its exterior along at least a portion of its length a plurality of sealing members each defining (1) a resilient, annular sealing portion lying generally in a plane substantially normal to the longitudinal axis of said leg and (2) a surface tapering inwardly from said annular sealing portion towards the distal end of said leg; and

a receiver adapted to be disposed against the other of said tissue portions opposite said fastening member, said receiver defining an aperture therein for receiving and fastening member leg after said leg has been inserted through said tissue portions, said receiver defining an annular retaining



ring on the inside surface of said aperture for engaging said annular sealing portion of one of said sealing members of said leg to prevent withdrawl of said leg from said aperture after said leg has been received in said receiver with the sealing portions of adjacent sealing members sealingly engaging the surface of said receiver in said aperture, whereby said annular retaining ring is isolated from the mammalian tissue by the sealing portions to prevent immediate absorption of said ring.

4,532,927

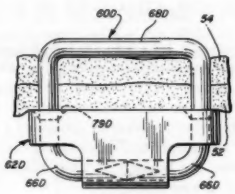
TWO-PIECE TISSUE FASTENER WITH NON-REENTRY BENT LEG STAPLE AND RETAINING RECEIVER

Anthony Miksza, Jr., Jersey City, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jun. 20, 1983, Ser. No. 506,087

Int. Cl.³ A61B *17/04*

U.S. Cl. 128—334 C **7 Claims**



1. A fastener adapted to hold together two portions of mammalian tissue, such as are defined by a wound or incision, to facilitate healing of the wound or incision, said fastener comprising:

an open loop fastening member, said fastening member comprising a pair of first and second legs with distal ends adapted to penetrate said tissue portions and a link connecting said legs that is adapted to lie substantially against one of said tissue portions; and

a receiver adapted to be disposed against the other of said tissue portions opposite said fastening member; said receiver having a leg receiving member for receiving one of said fastening member legs after said legs have been inserted through said tissue portions and having another leg receiving member for receiving the other of said fastening member legs after said legs have been inserted through said tissue portions; each of said leg receiving members having a first side adapted to be placed against one of said tissue portions and having a generally oppositely facing

second side; each of said leg receiving members defining a first passage extending between said first and second sides of said leg receiving member for receiving a portion of one of said fastening member legs; said receiver having a base between, and projecting outwardly from, said second sides of said leg receiving members; said base defining end walls projecting outwardly from said second sides of said leg receiving members; said base further having an additional passage or cavity extending completely through said base from one of said end walls to the other of said end walls for receiving another portion of each of said legs whereby a means for guiding said legs may be at least temporarily disposed adjacent said receiver for (1) directing the distal end of each of said legs at said leg receiving members second side from one of said first passage into said additional passage or cavity and (2) guiding said legs between said first passages and said additional passage or cavity as relative movement is effected between said fastening member and said receiver.

4,532,928

SURGICAL SUTURES MADE FROM ABSORBABLE POLYMERS OF SUBSTITUTED BENZOIC ACID

Rao S. Bezwada, Whitehouse Station; Shalaby W. Shalaby, Mountainville, and Dennis D. Jamiolkowski, Long Valley, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 459,428, Jan. 20, 1983,. This application Jul. 5, 1984, Ser. No. 627,933

Int. Cl.³ A61K *17/00*

U.S. Cl. 128—335.5 **23 Claims**

1. A surgical suture comprising a drawn and oriented fiber of an absorbable, radiation sterilizable, normally solid copolyester comprising the repeating divalent units of the formula:

$$+O—CO—Ph—X—CHR—CO—O+, \text{ (G), and } +O—CO—CHR'+$$

wherein Ph represents 1,2-, 1,3-, or 1,4-phenylene, or lower alkyl- or lower alkoxy-substituted phenylene, wherein R represents hydrogen, lower alkyl, phenyl, or benzyl, wherein X represents oxy, thio, or sulfonyl, wherein G represents the residue after removal of the alcohol groups of a dihydric alcohol, wherein R' represents hydrogen or methyl, and wherein said divalent units are bonded to each other through ester groups contained in said units.

4,532,929

DRY COATING OF SURGICAL FILAMENTS

Frank V. Mattei, Piscataway, and Donald W. Regula, Flagtown, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 23, 1984, Ser. No. 633,759

Int. Cl.³ A61L *17/00*

U.S. Cl. 128—335.5 **20 Claims**

1. A synthetic surgical filament having improved and substantially equal dry and wet tie-down properties, said surgical filament having been coated with from about 0.02 to 0.25 percent by weight of a composition consisting essentially of a dry, powdered, substantially water-insoluble, absorbable salt of a C_6 or higher fatty acid.

4,532,930

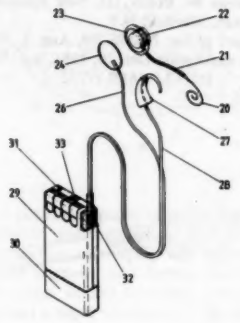
COCHLEAR IMPLANT SYSTEM FOR AN AUDITORY PROSTHESIS

Peter A. Crosby, Drummoyne; Christopher N. Daly, Bigiola Plateau; David K. Money, Pennant Hills; James F. Patrick, Lane Cove; Peter M. Seligman, Essendon, and Janusz A. Kuzma, Stanmore, all of Australia, assignors to Commonwealth of Australia, Dept. of Science & Technology, Belconnan, Australia

Filed Apr. 11, 1983, Ser. No. 483,806

Int. Cl.³ A61N *1/30*

U.S. Cl. 128—419 R **68 Claims**



Cochlear Implant System - Pictorial Representation

1. In a cochlear implant system having a sound-to-electrical stimulation encoder means, a body-implantable receiver-stimulator and electrodes for receiving electrical signals from said encoder means, the improvement comprising

means in said receiver-stimulator for preventing the delivery of a stimulation signal to the electrodes except after the receipt of a correct predetermined sequence of numerical information from said encoder means and

means in said encoder means for encoding each item of numerical information as a number of pulses in a burst of pulses.

4,532,931

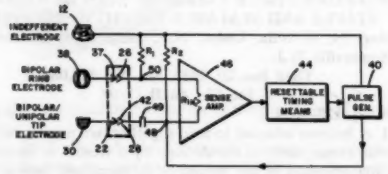
PACEMAKER WITH ADAPTIVE SENSING MEANS FOR USE WITH UNIPOLAR OR BIPOLAR LEADS

Perry A. Mills, Roseville, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jun. 29, 1984, Ser. No. 626,525

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **4 Claims**



1. In a cardiac pacer system of the type having electrical lead means comprising one or more distally disposed electrodes coupled by one or more elongated conductors to spaced and electrically isolated contact areas on a proximal connector pin, an implantable pulse generator means, resettable timing means coupled to said pulse generator means for causing said pulse generator means to produce electrical stimulating pulses at predetermined intervals unless said timing means is reset prior

to the end of said predetermined intervals, sensing means coupled to said resettable timing means, said pulse generator means, said resettable timing means and said sensing means being housed in a moisture-proof container made at least in part from a conductive material which, when said housing is implanted in a living body, is in contact with tissue and body fluids, said container having terminal means for receiving said proximal connector pin, said terminal means having first and second spaced contacts for conductively engaging said spaced and electrically isolated contact areas on said proximal connector pin, an improved sensing means comprising:

(a) a sense amplifier exhibiting a predetermined input impedance characteristic between a pair of input terminals thereof, said sense amplifier having an output terminal coupled to said resettable timing means;

(b) first and second impedance elements, each of an impedance value which is at least ten times greater than the impedance of animal tissue and body fluids proximate the location of said distally disposed electrodes but less than ten percent of said predetermined input impedance of said sensing amplifiers;

(c) means coupling said first and second impedance elements between said conductive material of said housing and a first and a second of said pair of input terminals of said sense amplifier, respectively;

(d) means coupling said first spaced contact of said terminal means of said container to said first input terminal of said pair of input terminals of said sense amplifier means; and

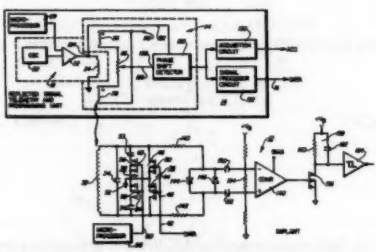
(e) means coupling said second spaced contact of said terminal means of said container to said second input terminal of said pair of input terminals of said sense amplifier means, said first and second spaced contacts in said terminal means of said container mating with said spaced and electrically isolated contact areas on said connector pin of said lead means.

4,532,932

IMPLANT COMMUNICATION SYSTEM WITH FREQUENCY SHIFT MEANS

John R. Batty, Jr., Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Jan. 3, 1984, Ser. No. 567,933
Int. Cl.³ A61N *1/08*
U.S. Cl. 128—631 **7 Claims**



1. In an implant communication system for use with an external telemetry and programming unit which generates a magnetic carrier signal at a selected frequency, and in which an implanted enclosure carries a tuned coil and a low impedance shunt circuit connected across the tuned coil including a device for modulating the impedance of the shunt circuit in accordance with a data signal to alter the phase and amplitude of a signal reradiated by said tuned coil in the presence of an externally generated magnetic carrier signal at a selected frequency, the improvement comprising:

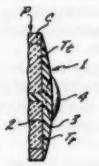
second shunt circuit means connected across said tuned coil including means for changing the tuning of the tuned coil to enable the tuned frequency to correspond to said selected frequency.

4,532,933

FOCUSING MECHANISM FOR AN ULTRASOUND DEVICE

D. Eugene Hokanson, 3324 - 72nd Ave. Southeast, Mercer Island, Wash. 98040

Filed Apr. 25, 1983, Ser. No. 487,934
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **13 Claims**



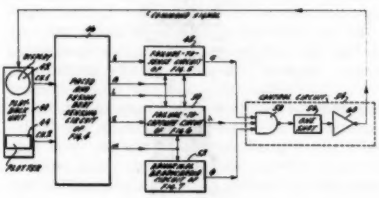
11. In a focusing mechanism for an ultrasound device having first transducer means for transmitting ultrasound waves through a wave-conducting medium toward matter spaced from such transducer means and second transducer means for receiving at least some of the transmitted ultrasound waves after impinging on such matter, the improvement comprising converging lens means for refracting the ultrasound waves and having an inner face adjacent to the first transducer means and an outer face remote from the first transducer means, said outer face having at least two curved portions of substantially different curvature for focusing ultrasound waves transmitted by the transducer means at different distances, respectively, from the first transducer means, the first and second transducer means being positioned in closely adjacent relationship and both curved portions of the lens means extending over portions of both of the transducer means.

4,532,934

PACEMAKER MONITORING RECORDER AND MALFUNCTION ANALYZER

George J. Kelen, New York, N.Y., assignor to Del Mar Avionics, Irvine, Calif.

Continuation of Ser. No. 214,955, Dec. 9, 1980, abandoned, which is a continuation of Ser. No. 956,878, Nov. 1, 1978, abandoned. This application May 17, 1983, Ser. No. 495,154
Int. Cl.³ A61B *5/04*
U.S. Cl. 128—697 **17 Claims**



1. In a magnetic tape recording system including separate tracks for ambulatory monitoring of the operation of a pacemaker and of the response of a patient to the pacemaker as revealed by the timing relationship between a pacemaker spike signal generated by the pacemaker and an ECG signal generated by the patient equipped with the pacemaker, an apparatus comprising:

first means for in an ambulatory mode for sensing the occurrence of a pacemaker spike signal and ECG signal;

second means for producing in response thereto a pacer tag signal whose frequency spectrum lies within a predetermined frequency bandwidth;

third means for recording the pacer tag signal and ECG

signal on separate tracks on said magnetic tape, said fourth means characterized by said predetermined bandwidth, only signals having a frequency within said predetermined bandwidth being recorded on said separate tracks said first, second and third means being ambulatory;

fourth means for stationary operation for playing back the recorded magnetic tape recorded by said third means at a selected one of a plurality of speeds higher than the recording speed at which it was originally recorded;

fifth means for determining during the high speed playback a logical timing relationship between the ECG signal and the pacer tab signal;

sixth means for selecting on the basis of the logical timing relationship of the ECG signal to the pacer tag signal one of several different output signals indicative of the operation of the pacemaker and of the response of the patient to the pacemaker

wherein said fourth means further comprises:

a pacemaker channel;

a separate identical ECG signal channel; and

an analysis module receiving occasional pacemaker spikes in said pacemaker signal channel and receiving occasional QRS complexes in said ECG signal channel, the signals in the two channels being correlated in time by said analysis module, said analysis module producing signals indicative of the operation of the pacemaker, said analysis module including a conditional logic circuit for generating an abnormal bradycardia signal after the occurrence of a QRS complex in the ECG signal channel contingent on the failure of receipt of a signal in said ECG channel within a variable time interval T5 after receipt of a signal in said pacemaker channel, said variable time interval T5 being dependent on playback speed of said fifth means, said signal being indicative of a subsequent QRS complex in the ECG signal channel,

whereby proper operation of said pacemaker in response to heart activity is monitored and verified.

4,532,935

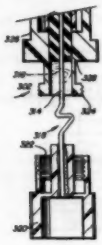
BRONCHOSCOPIC NEEDLE ASSEMBLY

Ko P. Wang, 813 Jamieson Rd., Lutherville, Md. 21093

Continuation-in-part of Ser. No. 438,245, Nov. 1, 1982, which is a continuation-in-part of Ser. No. 260,602, May 6, 1981, abandoned. This application Mar. 7, 1983, Ser. No. 472,603

Int. Cl.³ A61B *10/00*; A61M *5/00*

U.S. Cl. 128—753 **13 Claims**



10. A completely flexible bronchoscopic needle assembly for use with a flexible bronchoscope comprising:

an elongated flexible catheter having proximal and distal ends and defining an interior cavity therebetween;

a hollow needle coaxially fixed to said catheter distal end, the hollow of said needle being in communication with said interior cavity;

a flexible stylet slideably received in said interior cavity and being of sufficient length to extend beyond the end of the needle and the proximal end of said catheter, said stylet being reciprocally moveable between an extended position wherein the distal end of the stylet extends beyond the end of the needle and a retracted position wherein the distal end of the stylet is retracted into said catheter;

means operatively associated with said distal end of said catheter for protecting said bronchoscope and said patient from inadvertent damage while yet permitting penetration of said tissue to obtain samples thereof when desired;

aspirating means in fluid communication with said inner cavity and connected to said stylet for relatively positioning said stylet in said catheter and for creating a suction source sufficient to transport said tissue samples through said catheter inner cavity so that said tissue samples will be collected for examination;

locking means operatively associated with said aspirator means for locking said stylet in said extended position;

retraction-preventing means operatively associated with said stylet for preventing retraction of said stylet in response to axial compressive forces acting thereon in a direction towards said retracted position when said stylet is in said extended position, said retraction-preventing means including (a) means defining a bearing surface, and (b) means defining a spring area integral with said stylet, said spring area-defining means for bearing against said bearing surface to be flexed thereagainst in response to said locking means locking said stylet in said extended position to exert a bias force against said bearing surface thereby biasing said stylet into said first position to resist axial compressive forces acting thereon tending to encourage said stylet to be withdrawn into said needle, whereby retraction of said stylet in response to said compressive forces is prevented.

4,532,936

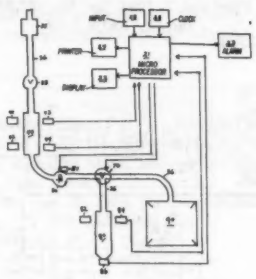
AUTOMATIC URINE FLOW METER

Eric G. LeVeen, 321 Confederate Cir., Charleston, S.C. 29407, and Robert F. LeVeen, 312 Lombard St., Philadelphia, Pa. 19147

Filed Aug. 21, 1981, Ser. No. 295,073

Int. Cl.³ A61M *1/00*

U.S. Cl. 128—762 **4 Claims**



1. A fluid measurement and collection apparatus, comprising a collection means adapted to collect urinary output from a patient and a microprocessor means adapted to measure urinary output in said collection means; said collection means comprising in combination, measurement column means, said measurement column means being adapted to receive and retain fluid for optical measurement, first and second optical sensor means positioned adjacent said measurement column means, said first optical sensor means being adapted to indicate whether said measurement column means is substantially empty, said second optical sensor means being adapted to indicate whether said measurement column is substantially full, pump means coupled to said measurement column means, said pump means being adapted to remove fluid from said measurement column means at a known pump flow rate, and collection bag means coupled to said pump means, said collection bag

means being adapted to receive fluid removed from said measurement column means by said pump means; clock means adapted to indicate time intervals, said clock means being coupled to said microprocessor means, said first and second optical sensor means and said pump means being coupled to said microprocessor means, said microprocessor means being adapted to activate said pump means when said second optical sensor means indicates that said measurement column means is substantially full, to drain said measurement column means and measure time intervals indicated by said clock means until said first optical sensor means indicates said measurement column means is substantially empty, and to determine volume of said fluid equal to the measured time intervals multipled by the known pump flow rate.

4,532,937

SEBUM COLLECTION AND MONITORING MEANS AND METHOD

David L. Miller, Dallas, Tex., assignor to Cuderm Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 453,836, Dec. 28, 1982, abandoned. This application Nov. 28, 1983, Ser. No. 555,817
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—759 **15 Claims**

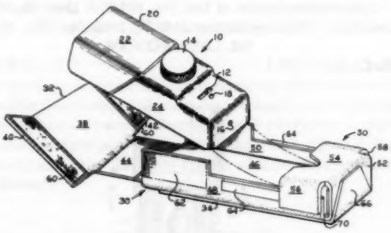
1. A device for collecting sebum as it is secreted from the sebaceous glands of a subject which comprises (a) an open-celled, microporous, hydrophobic polymeric film having coated on a major surface thereof (b) a layer of synthetic, pressure-sensitive adhesive consisting essentially of high molecular weight components that are resistant to migration into the pores of said microporous film, said layer of adhesive being sufficiently thick and continous to hold said microporous film in close proximity with the openings of said sebaceous glands, yet sufficiently thin to permit passage therethrough, and into said pores of said microporous film, of substantially all of the sebum secreted by said glands during a period of contact between said device and said sebaceous glands, said microporous film having a pore volume of from about 25% to about 50%, a film thickness of from about 0.01 mm to about 0.05 mm, the pores of said film having a mean effective diameter of less than about 0.1 micron, and said film being opaque to light or opolescent when its pores are filled with gaseous material but substantially translucent when said pores are filled with sebum or another hydrophobic substance.

4,532,938

ELECTROTHERAPY APPARATUS

Floyd L. Carlisle, Clinton, Conn., assignor to Theratronics, Inc., Essex, Conn.

Filed May 4, 1983, Ser. No. 491,607
Int. Cl.³ A61N *1/04, 1/36*
U.S. Cl. 128—801 **4 Claims**



1. Electrotherapy apparatus comprising:

signal generator means, said signal generator means including a housing with first and second ends, a signal generator for providing output voltage pulses being disposed in said housing, said signal generator means further including an integral socket in said first end of said housing, said socket having at least a pair of electrical contacts, said signal generator being electrically connected to said contacts whereby output voltage pulses provided by said signal generator will be applied across said socket contacts; and

case means for receiving and supporting said signal generator means, said case means including:

a receptacle defining member, said receptacle defining member being adjustable between an open signal generator means receiving condition and a closed signal generator means retention condition, said receptacle defining member being comprised of a non-conductive material and having a first substantially continuous flat side, said receptacle defining member further having a first pair of oppositely disposed walls extending in the same direction from opposite edges of said first side, said receptacle defining member additionally having a first end defining member articulated to said first side at one end thereof and a first top member articulated to said first end defining member, said receptacle defining member also having a second pair of oppositely disposed walls articulated to said top member, said receptacle defining member additionally including complementary fastener means on said walls of said first and second pairs of oppositely disposed walls, said fastener means cooperating such that said walls of said second pair may be releasably coupled to said walls of said first pair to define a receptacle wherein said first flat side is disposed opposite to and displaced from said top member;

a generally L-shaped electrode support member, said electrode support member including a base portion and a leg portion extending generally transversely with respect to said base portion, said electrode support member base portion being secured in abutting relationship to said receptacle defining member first flat side, said electrode support member leg portion extending at least part way across the receptacle defined by said receptacle defining member at the second end thereof, said second end being opposite to the end defined by said first end defining member;

a pair of electrodes mounted from said electrode support member base portion, said electrodes being spacially displaced and being positioned on the exterior surface of said case means;

a plug having at least a pair of electrically isolated contacts, said plug being complementary in shape to said signal generator means integral socket;

mounting means for said plug, said mounting means supporting said plug so that said plug projects into said case means defined receptacle at the second end thereof, insertion of said signal generator means into said case means causing engagement of said plug with said socket to establish electrical contact between respective contacts of said plug and socket; and

conductors connected to and extending between individual of said electrodes and respective contacts of said plug contacts, said conductors being partly disposed between said electrode support member base portion and said receptacle defining member first flat side.

4,532,939

NONCONTACTING, HYPERTHERMIA METHOD AND APPARATUS FOR DESTROYING LIVING TISSUE IN VIVO

Tex Yukl, Pleasant Valley Rte., Box 21, Baker, Oreg. 97814

Filed Oct. 18, 1982, Ser. No. 434,823
Int. Cl.³ A61N *5/02*
U.S. Cl. 128—804 **5 Claims**

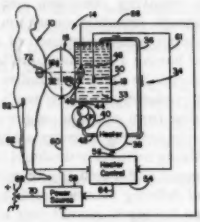
1. A noninvasive, noncontacting method for causing cell destruction in a preselected site in living tissue through a technique employing an external tissue simulator, said method comprising

creating a pair of spaced electromagnetic-energy focal re-

gions wherein energy-effected electrical/thermal changes occurring adjacent one produce related electrical/thermal changes adjacent the other,

placing one of such focal regions inside such tissue adjacent the location of such preselected site,

placing the other focal region inside such external tissue simulator,



monitoring the electrical/thermal conditions adjacent the location of the other focal region in such simulator, and

maintaining the placement of such one focal region until said monitoring indicates that a predetermined electrical/thermal condition has existed in such simulator over a predetermined period of time.

4,532,940

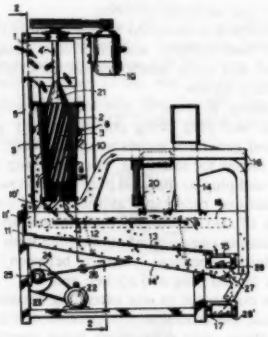
CORN SHELLER

Atanas L. Mitkov; Ivan N. Georgiev; Peter T. Radulov; Le K. Hung, and Atanas K. Atanassov, all of Russe, Bulgaria, assignors to V T U "Angel Kanchev", Russe, Bulgaria

Filed Jan. 20, 1983, Ser. No. 459,687

Int. Cl.³ A01D *9/00*

U.S. Cl. 130—6 **7 Claims**



1. A corn shelling apparatus having a supporting frame and a receiving hopper mounted on its upper part, beneath the hopper there being at least one shelling unit made up of an inner drum and an outer counter-drum, the drum being fitted inside the counter-drum, and means connected by a fan and chute for removing the impurities, the stripped corn cobs, and the kernels, the improvement wherein the drum is cylindrical, the counter-drum is frusto-conical and has its larger diameter turned upwardly toward the receiving hopper, the axes of the drum and counter-drum are vertical, and the peripheral surfaces of the drum and counter-drum are made of rods, the rods of the drum being disposed parallel and skewed with respect to vertical axial sections of the drum, and the rods of the counter-drum are disposed along the generant of a cone, and comprising an inclined kernel-collecting plane member enveloping the counter-drum and mounted upon the supporting frame of the apparatus.

4,532,941

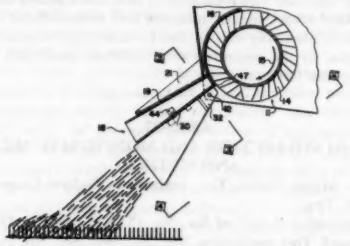
DISCHARGE CONTROL ATTACHMENT FOR A COMBINE HARVESTER

Alfred J. Gauthier, Box 212, St. Claude, Manitoba, Canada (R0G 1Z0)

Filed Aug. 31, 1984, Ser. No. 646,145

Int. Cl.³ A01F *12/40*

U.S. Cl. 130—27 R **16 Claims**



1. An attachment for a combine harvester of the type having a straw discharge including a straw chopper assembly rotatable about a substantially horizontal axis transverse to the combine harvester for chopping the straw and forcefully discharging the straw in a generally rearward direction from the combine harvester, and fins rearward of the chopper assembly for directing the discharged straw outwardly to the sides thereof, the attachment comprising a plate member, means arranged for mounting the plate member on the combine harvester rearwardly of the chopper assembly and generally transverse to the combine harvester with an underside surface thereof at an angle to the horizontal so as to cover the fins to prevent discharged straw from engaging said fins whereby, in use, the discharged straw from the chopper assembly directly contacts the surface and is directed thereby downwardly to engage the ground under force from the chopper assembly and two side guide members each extending generally downwardly from the underside of the plate member, and arranged at respective ends of the plate adjacent the sides of the combine harvester and inclined inwardly relative to the rearward direction to direct the discharge straw inwardly whereby the straw engages the ground over a width less than the width of the combine harvester to form a swath.

4,532,942

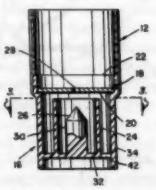
MINIATURE TOBACCO FILTERS

Leslie N. Aikman, 3628 Ocean Blvd., Corona del Mar, Calif. 92625

Continuation-in-part of Ser. No. 104,875, Dec. 18, 1979, abandoned. This application Jun. 27, 1980, Ser. No. 163,607

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—198.1 **6 Claims**



1. For a cigarette filter of the type that includes a barrier which extends across the smoke flow path, an air and smoke mixing chamber upstream from the barrier and openings, one by which ambient air flows into the chamber and the other by

which a stream of smoke, air and condensate flows through the barrier, an improved condensate collector which comprises:

means in the form of a cone surface in the path of the stream of smoke, air and condensate and which is wetted by the condensate for intercepting condensate as it flows through the barrier;

said cone being oriented at an angle to the direction of flow of said stream such that the condensate intercepted at a point on said surface tends to adhere to the wetted surface and such that the smoke and air are directed against previously intercepted condensate and exert a force tending to move said condensate along said surface to a position beyond the point of interception; and

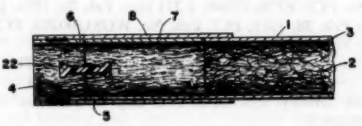
means for conducting ambient air into said chamber in parallel with said smoke path via a plurlaity of air inlet paths opening at spaced points around the periphery of said mixing chamber at its upstream end.

4,532,943

ADJUSTABLE FILTER CIGARETTE

Walter A. Nichols, and Reginald W. Newsome, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,392
Int. Cl.³ A24D *1/04*; A24F *13/04*
U.S. Cl. 131—336 **27 Claims**



1. A filter cigarette comprising a tobacco rod, a substantially cylindrical filter plug, a plug wrapping circumscribing said filter plug, and tipping paper circumscribing and joining said filter plug and a portion of said tobacco rod, at least one of said plug wrapping and said tipping paper being substantially air-impermeable, said filter plug comprising a mouth-end segment of filter tow material axially connected to a rod-end segment of filter tow material for rotation about the axis of the cigarette, the filter tow material of the mouth-end segment being in direct contact with the filter tow material of the rod-end segment.

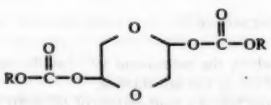
4,532,944

SMOKING COMPOSITIONS CONTAINING A DICARBONATE ESTER FLAVORANT-RELEASE ADDITIVE

Kenneth F. Podraza, Richmond, Va., assignor to Philip Morris Inc., New York, N.Y.

Filed Apr. 23, 1984, Ser. No. 603,035
Int. Cl.³ A24B *3/12*
U.S. Cl. 131—277 **6 Claims**

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and non-tobacco substitutes, and (2) between about 0.0001 and 2 weight percent, based on the total weight of filler, of a dicarbonate ester flavorant-release additive corresponding to the formula:



where R is a substituent selected from aliphatic, alicyclic and aromatic radicals.

4,532,945

PROCESS FOR INCREASING AND MAINTAINING THE FILLING POWER OF TOBACCO

Gus D. Keritsis, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 14, 1983, Ser. No. 542,247
Int. Cl.³ A24B *3/18*
U.S. Cl. 131—291 **8 Claims**

1. A process for increasing and maintaining the filling power of tobacco, comprising steps (a) and (b) in any order followed by step (c):

(a) applying an effective amount of a cross-linking agent to the tobacco;

(b) impregnating said tobacco with an expansion agent; and

(c) heating the tobacco containing the expansion agent and the cross-linking agent to react the cross-linking agent with the tobacco, to expand the tobacco, and to stiffen the tobacco;

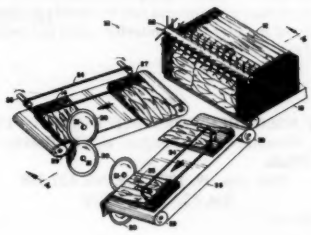
wherein the tobacco is selected from the group consisting of tobacco leaf, cured tobacco leaf, tobacco filler, and reconstituted tobacco sheet; and wherein the cross-linking agent is selected from the group consisting of polyfunctional carboxylic acids, acid anhydrides of polyfunctional carboxylic acids, acid chlorides of polyfunctional carboxylic acids, carbonyl chloride, aldehydes, dialdehydes, azides, diazides, $(NH_4)_2HPO_4$, ketones, polybasic inorganic acids and salts thereof, amides, lactones, aldehydic sugars, and keto sugars.

4,532,946

METHOD AND APPARATUS FOR TIPPING TOBACCO LEAVES PACKED IN BALES

Frank C. King, Jr., Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 12, 1984, Ser. No. 599,848
Int. Cl.³ A24B *5/00, 7/06*
U.S. Cl. 131—327 **7 Claims**



1. A tobacco bale tipping apparatus comprising:

flaking means for removing slabs of tobacco from a tobacco bale;

spreading means for separating said slabs into right handed and left handed wedges of tobacco; and

tipping means for removing the tips of the tobacco leaves from said right handed and left handed wedges of tobacco.

4,532,947

FILTER FOR REDUCING THE TOXIC EFFECTS OF CIGARETTE TOBACCO SMOKE

Jane R. Caseley, Withyham, England, assignor to Windleshaw Enterprises Limited, East Sussex, England

Filed May 9, 1984, Ser. No. 610,084
Claims priority, application United Kingdom, May 12, 1983, 8313044
Int. Cl.³ A24D *1/18, 3/00, 3/02, 3/06*
U.S. Cl. 131—331 **9 Claims**

1. A filter for use in association with cigarette tobacco, wherein the filter contains, as active component, at least one

non-toxic inorganic or organic salt of a compound of the general formula:

$$H—S—X—SO_3H$$

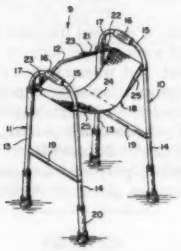
in which X is a straight or branched alkylene radical containing 2 to 6 carbon atoms, and/or cysteine and/or acetylcysteine.

4,532,948

WALKER WITH A FLEXIBLE SEAT

Esther J. Burrows, 57-132B Piedmont Dr., Port Jefferson, N.Y. 11776

Filed Feb. 21, 1984, Ser. No. 581,728
Int. Cl.³ A61H *3/00*
U.S. Cl. 135—67 **15 Claims**



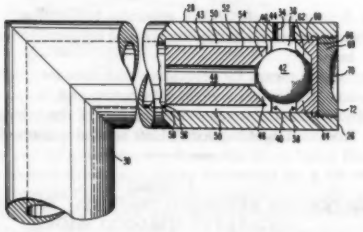
1. A seat for a walker comprising a substantially rectangular sheet of flexible material having fastening means on the narrow ends thereof for slidably fastening the seat to the opposite horizontal braces of a walker, to suspend the seat in a slack manner, whereby the seat can be used to support a seated person, and due to its slidable fastening means and the flexibility of the slack material, the seat can be readily pushed forward by the body of the user to not interfere with the usual walking attitude of the user.

4,532,949

ENERGY ABSORBER FOR HIGH ENERGY FLUID JET

Ed Frank, Glenolden, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1982, Ser. No. 427,358
Int. Cl.³ F16L *55/02*
U.S. Cl. 137—1 **15 Claims**



1. An energy absorber for absorbing energy from a high energy fluid stream emanating from a high energy fluid nozzle, said energy absorber comprising:

an energy absorbing chamber adapted to receive the high energy fluid stream emanating from the high energy fluid nozzle and being defined by spaced first and second seats positioned within a fluid flow conduit which is spaced from the high energy fluid nozzle, said first and said second seats including first and second seat faces forming a portion of said energy absorbing chamber;

an inlet aperture in said fluid flow conduit, the high energy fluid passing through said inlet aperture and into said energy absorbing chamber;

a freely rotatable ball positioned in said energy absorbing chamber between said first and second seats generally in alignment with the high energy fluid stream, said ball being struck and caused to rotate by the high energy fluid stream to dissipate the energy of the high energy fluid stream; and,

means to exhaust the energy dissipated fluid from said energy absorbing chamber after the energy of the fluid has been absorbed and dissipated by causing said ball to rotate, said means including first and second fluid flow passages in said first and said second seat faces, said first and said second fluid flow passages directing said energy dissipated fluid from said energy absorbing chamber to said fluid flow conduit.

4,532,950

PROCESS FOR THE PERMANENT DEFORMATION OF HAIR

Günther Lang, Nieder-Beerbach, and Theodor Wajaroff, Darmstadt, both of Fed. Rep. of Germany, assignors to Wella AG, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP80/00049, § 371 Date Feb. 20, 1981, § 102(e) Date Feb. 20, 1981, PCT Pub. No. WO81/00203, PCT Pub. Date Feb. 5, 1981
Continuation of Ser. No. 243,936, Feb. 20, 1981,. This PCT application Jul. 11, 1980, Ser. No. 504,841
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1979, 2929865
Int. Cl.³ A45D *7/00*
U.S. Cl. 132—7 **3 Claims**

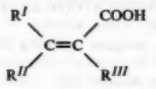
1. Process for the permanent deformation of hair, comprising the steps of

1. applying to the hair a freshly prepared aqueous composition obtained by mixture of two components

(a) component 1 of which containing as a hair keratin reducing substance alkalisulfite, ammonium sulfite, thioglycolic acid, thiolactic acid or a water soluble salt of thioglycolic acid or thiolactic acid and

(b) component 2 containing a compound selected from the group consisting of

(i) carboxylic acids with activated double bonds of the formula



in which the substituents R^I and R^{II} represent H, COOH, CH_2COOH, $CH(CH_3)COOH$, C_6H_5 or CH_3, and R^{III} represents H, C_1–C_6-alkyl or CH_2COOH, with the proviso that R^I is different from R^{II} and at least one of the substituents R^I and R^{II} represents COOH, or the salt thereof, and

(ii) carboxylic acids with activated triple bonds of the formula

$$HOOC—C{\equiv}C—R^{IV}$$

in which the substituent R^{IV} has the meaning H or COOH, or the salt thereof;

2. holding the hair at a temperature of 20° to 80° C. for a time period of 10 to 50 minutes in the desired shape;

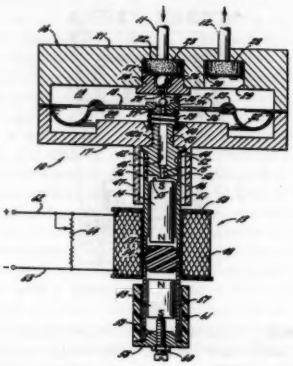
3. fixing the hair in the desired shape by application of an aqueous hydrogen peroxide solution; and rinsing the hair.

4,532,951

TRANSDUCER UTILIZING ELECTRICAL AND PNEUMATIC SIGNALS

Raymond J. Fermanich, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Mar. 28, 1983, Ser. No. 479,657
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—84 **11 Claims**



1. An electrical-pneumatic transducer having, in combination, a housing having a supply pressure inlet, a control pressure outlet and a regulating nozzle, said inlet being adapted for connection to a source of fluid under pressure, means disposed within said housing and operable to regulate the pressure of fluid at said outlet in response to the rate of fluid flow through said nozzle, a first elongated permanent magnet disposed coaxially with said nozzle, the ends of said magnet being of different polarity with one end of the magnet opposing the nozzle, a coil of electrically conductive wire disposed outside said housing coaxially with said nozzle and encircling at least a portion of said magnet, said magnet being urged axially endwise relative to said nozzle to vary the rate of fluid flow through the latter and being urged by the energization of said coil whereby the force on the magnet is correlated with the degree of energization of the coil and the pressure at said outlet is correlated with said force, a second elongated permanent magnet disposed end to end with said first magnet and spaced from the latter, the ends of said second magnet being of different polarity and oriented relative to said first magnet to urge said first magnet in an endwise direction, and means for manually moving said second magnet toward and away from said first magnet to vary the effect of the second magnet on the first magnet thereby to calibrate the transducer.

4,532,952

CONTROLLER FOR WELL INSTALLATIONS

William L. Norwood, San Antonio, Tex., assignor to Logic Controls Corp., Converse, Tex.

Division of Ser. No. 216,781, Dec. 15, 1980, Pat. No. 4,352,376. This application May 14, 1982, Ser. No. 378,108
Int. Cl.³ F16K *51/00*; **F16J** *15/14*
U.S. Cl. 137—240 **12 Claims**

12. A controller for use in the control of well installations, comprising:

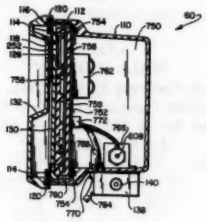
a principal housing having an enclosable cavity portion formed inwardly of a continuous peripherally disposed ledge;

a controller circuit mounted upon a circuit board and having a visual display mounted at a predetermined position thereon;

a circuit housing having a sealing cavity portion for supportably receiving said circuit board and formed having an opening therein for providing visual access to said visual display;

a polymeric sealing material positioned within said circuit housing cavity portion surrounding said circuit board in sealing relationship;

means for removably attaching said circuit housing in abutting engagement with said principal housing ledge to effect the enclosure of said cavity portion;



means defining a seal intermediate said principal housing ledge and said circuit housing;

a gas driven valve actuated intermittently under the control of said circuit for introducing a non-corrosive hydrocarbon gas into said principal housing cavity to derive a positive pressure therewithin when enclosed; and

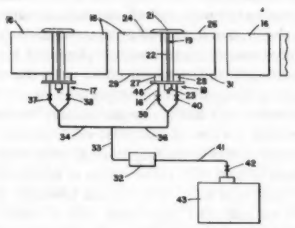
including check valve means mounted in said cavity for effecting control of said positive pressure.

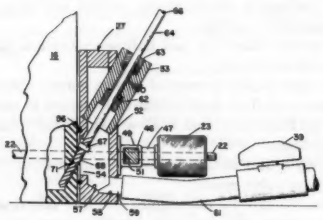
4,532,953

APPARATUS FOR TAPPING AND DRAINING BATTERIES

Ambrose L. Rysewyk, Elgin, Ill., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,859
Int. Cl.³ F17C *13/04*
U.S. Cl. 137—255 **9 Claims**





1. An apparatus for tapping and draining electrolyte from a pair of adjacent batteries, which comprises:

a pair of chambers each having an opening surrounded by a compressible seal;

a gripping device mounted on said chambers having means

positionable between a pair of batteries for gripping two walls of the pair of batteries;

means for moving said chambers relative to said gripping device to move said chambers towards the pair of batteries to press said compressible seals against the batteries;

means mounted on and extendable through said chambers and said openings therein for drilling holes in the batteries; and

means for applying vacuum to the interiors of said chambers.

4,532,954

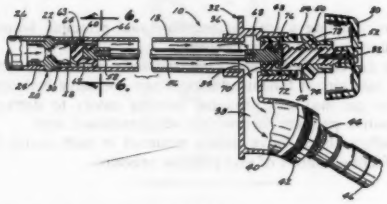
WALL HYDRANT

Russell E. Fillman, Colorado Springs, Colo., assignor to Woodford Manufacturing Company, Colorado Springs, Colo.

Filed Jul. 24, 1984, Ser. No. 633,908

Int. Cl.³ E03B 9/14

U.S. Cl. 137—302 **2 Claims**



2. A wall hydrant, comprising,

a hollow cylindrical tube having an inlet end and an outlet end,

an inlet valve seat connector having an outwardly facing inlet valve seat therein and opposite inner and outer ends,

means for connecting said inner end of said inlet valve seat connector to a source of fluid under pressure,

means for connecting said outer end of said inlet valve seat connector to the inlet end of said hollow tube,

an inlet valve means in said tube adjacent said inlet end, said inlet valve means comprising a cylindrical body portion having inward and outward ends, with the inward end terminating in an arcuate nose portion,

said inlet valve seat being complementary in shape to the arcuate nose portion of said inlet valve means,

valve control means extending through said tube and being connected to said inlet valve means to selectively longitudinally slide said inlet valve means inwardly to a closed position on said inlet valve seat, and to selectively slide said inlet valve means outwardly to an open position whereby fluid may enter the inlet end of said tube and flow outwardly therethrough around said nose portion and said body portion,

a fluid means located in said hollow cylindrical tube adjacent said outlet end,

a drain valve means connected to said valve control means adjacent said fluid drain means and adapted to control the flow of fluid from said hollow cylindrical tube to said drain means,

a drain valve seat in said hollow cylindrical tube adjacent said drain valve means,

said valve control means adapted to close said drain valve means when said inlet valve means is open, and to open said drain valve means when said inlet valve means is closed,

and said drain valve means having a longitudinally extending groove on the outer surface thereof and being adapted for only a limited fluid flow immediately prior to the time that said inlet valve means is fully open.

4,532,955

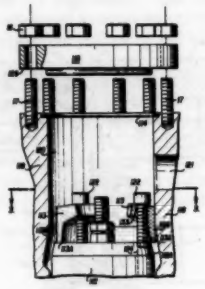
WEDGE LOCK VALVE RETAINER

V. Alan Squires, Grove City, Pa., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 9, 1984, Ser. No. 587,970

Int. Cl.³ F16K 43/00

U.S. Cl. 137—15 **21 Claims**



21. A method for retaining a compressor check valve assembly within a compressor cylinder using wedge segments, comprising the steps of:

locating the check valve assembly from within the cylinder;

disposing wedge segments between the check valve assembly and the cylinder; and

driving said wedge segments into frictional engagement with said check valve assembly and cylinder for retaining the check valve assembly within the cylinder.

4,532,956

SOLENOID ACTUATED VALVE BLOCKS FOR GLASSWARE FORMING MACHINES

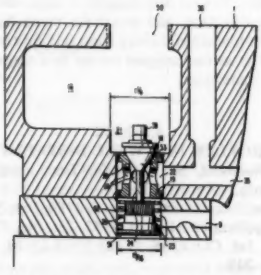
Luis Cardenas-Franco, and Enrique Veazey-Menéndez, both of Monterrey, Mexico, assignors to Vitro-Tec Fideicomiso, Monterrey, Mexico

Division of Ser. No. 330,918, Dec. 15, 1981, Pat. No. 4,478,241. This application Jan. 9, 1984, Ser. No. 569,094

Claims priority, application Mexico, Dec. 16, 1980, 185295

Int. Cl.³ F16K 49/00

U.S. Cl. 137—340 **7 Claims**



1. A solenoid actuated valve block for glassware forming machines, which comprises the combination of a metal block (1) provided with an inner longitudinal, operational air manifold (16); a plurality of valve chambers arranged in a staggered array and opening towards a lower surface of said metal block at one of their ends and towards said operational air manifold at the other one of their ends, each of said valve chambers comprising an upper cylindrical section (22) opening directly toward said operational air manifold and a lower cylindrical

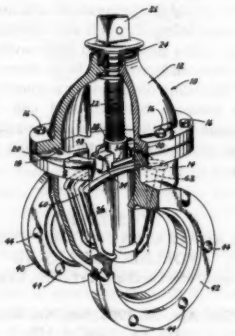
section (23) opening directly toward said lower surface of said metal block, said lower section of said chambers having a diameter which is smaller than the diameter of said upper cylindrical section thereof; a plurality of cartridge valves (17) arranged within said valve chambers, said cartridge valves comprising a valve body which comprises a cylindrical side wall (38) provided with a plurality of communicating openings (26), with said side wall spanning only the length of said upper cylindrical section of said valve chambers and being sealed at both ends thereof against said section, and a valve stem (24) having two oppositely arranged upper and lower plugs for obturating respectively upper and lower end openings provided in said valve body, said valve stem projecting outwardly and downwardly of said valve body to a distance sufficient to span the length of said lower cylindrical section of said valve chambers, a plunger (51) attached to a lowermost end of said valve stem and slidable over the inner surface of said lower cylindrical section of the valve chambers, and a return spring (25) arranged around said valve stem and lower plug, with the upper end of said spring bearing on the lower end of said valve body and the lower end of said spring bearing on said plunger; each valve chamber having a duct for operational air opening into the upper cylindrical section thereof and individually connected with a pneumatic operative line (35, 36) of the machine and an exhaust duct (9) opening into the lower cylindrical section thereof and communicated with the atmosphere; a plurality of solenoids arranged in bores (50) provided in an upper surface of said metal block and crossing said operational air manifold, said solenoids having a piston (31) coupled with an upper end of the valve stem of each cartridge valve for actuation thereof; and a closed chamber (37) on the upper surface of said metal block and housing all the solenoids to form a cooling manifold therefor.

4,532,957

GUIDES FOR GATE VALVES

Billy J. Battle, Birmingham, and Lawrence S. Jones, Hueytown, both of Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Jun. 24, 1983, Ser. No. 507,627
Int. Cl.³ F16K *27/00*
U.S. Cl. 137—375 **5 Claims**



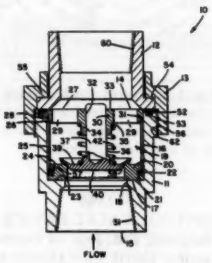
1. In a resilient seated gate valve comprising a valve body coating over its entire interior surface with a corrosion resistant coating, a gate, means for raising and lowering said gate, means for guiding said gate during raising and lowering, said means for guiding said gate comprising a groove in each side of said gate and a mating rail on the inside of said valve body, the improvement comprising a coating of a rubber material covering all of the outside surfaces of said gate except for each of said grooves in each side of said gate and a thermoplastic or thermosetting plastic insert held inside each of said grooves in said gate and forming a groove for engaging said mating rail inside said valve body whereby said corrosion resistant coating on said mating rail is protected from abrasion.

4,532,958

CHECK VALVE HAVING REPLACEABLE VALVE ASSEMBLY

Pellegrino E. Napolitano, Middletown, N.J., assignor to Hudson Engineering Company, Bayonne, N.J.

Filed Sep. 30, 1982, Ser. No. 428,764
Int. Cl.³ F16K *25/00*
U.S. Cl. 137—454.2 **1 Claim**



1. A replaceable check valve assembly comprising:

(a) an annular base member including a laterally outwardly opening peripheral groove to receive an outer peripheral seal in the form of a flexible O-ring positioned inwardly of the ends of said base member, said base member having a conical valve seat spaced inwardly of said peripheral seal and including a tapered extension which diminishes in thickness in an outward direction and is obliquely outwardly inclined relative to the axis of said assembly to define an opening;

(b) an annular sleeve having a first end removably secured to said base member and a second end;

(c) a spider member having an outer ring removably secured to the second end of said sleeve, said spider member including a plurality of radially inwardly directed ribs termination in a hub, said hub including a central bore;

(d) a valve member including a stem slidably received within said bore, said valve member having a conical valve face at one end including an outwardly extending tapered extension adapted to engage in surface contact with said tapered extension of said valve seat and close the opening defined thereby, said valve face including an inclined portion having a greater inclination relative to the axis of the assembly than the inclination of the valve face to define an annular space between said valve face and said valve seat and facilitate separation of said valve face and said valve seat; and

(e) biasing means to bias said valve member against said valve seat, said biasing means including a compression coil spring.

4,532,959

VALVING ELEMENT FOR A PLATE-TYPE VALVE

Kevin Hartshorn, Plainsboro, and Wallace A. McGahan, Lawrenceville, both of N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

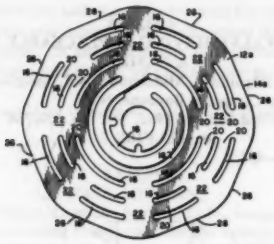
Filed Jan. 16, 1984, Ser. No. 570,949
Int. Cl.³ F16K *15/08*
U.S. Cl. 137—516.13 **21 Claims**

1. A valving element for a plate type valve, comprising:

a plate;

said plate having (a) apertures formed therein for the conduct of fluid therethrough, (b) a given center, and (c) an outer periphery defining the outermost edge of said plate; wherein

said apertures subtend given arcs drawn from said given center; and



given ones of said apertures each having a first portion intermediate the length thereof which is more proximate to said edge than are other portions thereof which subsist at either sides of said first portion.

4,532,960

CONTROL VALVE DEVICE

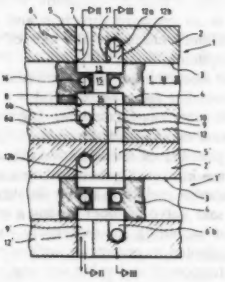
Rudolf Brunner, Baldham, Fed. Rep. of Germany, assignor to Heilmeier & Weinlein Fabrik Fuer Oel-Hadraulik GmbH & Co., KG, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 588,076

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3308576

Int. Cl.³ F15B *13/08*

U.S. Cl. 137—596.13 **15 Claims**



1. A control valve device including at least one control valve, in particular for use with high-pressure hydraulic systems having high flow rates, comprising a housing within which a piston slide means can be displaced in at least one housing bore from a neutral position with zero-pressure flow to at least one control position for the purpose of controlling the pressure medium flow, the zero-pressure flow being blocked by said piston slide means in said control position, and further comprising at least one pressure passage leading to and at least one discharge passage leading away from the housing bore, said pressure passage and said discharge passage being adapted to be interconnected through flow conduits provided in the piston slide means, characterized in that the discharge passage (**9**, **12**, **35**) ends in the housing bore (**3**, **32**) at a location displaced relative to the pressure passage (**5**, **6**, **34**) in the longitudinal direction of the bore, that the pressure passage and the discharge passage orifices (**7**, **10**) in the housing bore are each diametrically opposed by a recess (*6b*, *12b*; **36**, **37**) of the same size which is open towards the housing bore (**3**), that each recess (*6b*, *12b*; **36**, **37**) has applied thereto the pressure existing within the respective opposite passage (**5**, **6**; **34**; **9**, **12**; **35**) via at least one pressure or discharge connection passage (*6a*, **6**; *12a*, **12**; **38**, **39**, **40**) and that the piston slide means has provided therein in front of each passage orifice (**7**, **10**) a longitudinally extending pocket (**13**, **14**; **41**, **42**) bridging in the neutral position the longitudinal displacement between the respective passage orifice (**7**, **10**) and the respective neighbouring recess (*6b*, *12b*; **36**, **37**).

4,532,961

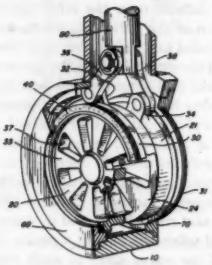
BIDIRECTIONAL DISC THROTTLING VALVE

Herbert H. Walton, and Steven D. Keboe, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Filed Nov. 22, 1982, Ser. No. 443,704

Int. Cl.³ F16K *11/14*, *31/52*

U.S. Cl. 137—625.31 **7 Claims**



1. A throttling valve comprising:

a body defining a cavity;

a pair of throttling discs, each defining at least one port, positioned for relative movement in a flowpath for varying the relationship between said port to control flow in said flowpath, said discs each having a smooth surface in wiping contact with each other for assisting in removal of contaminants thereon and each including an ear on the periphery thereof;

operating means, including an operating stem and a pair of toggle links engaging said ears and said operating stem in a toggle arrangement outside said flowpath, for effecting movement of said throttling discs, said discs being coupled to each other solely through said operating means;

end bearing means mounted in said cavity and defining a distance between bearing surfaces thereon; and

said pair of throttling discs having a combined thickness less than the distance between said end bearing surfaces whereby said throttling discs are permitted to move between said end bearing surfaces in the direction of said flowpath.

4,532,962

METERING APPARATUS FOR DISPENSING PRECISE VOLUMES OF LIQUID

Daniel N. Campau, 656 Duxbury Crt., SE., Grand Rapids, Mich. 49506

Filed Apr. 20, 1984, Ser. No. 602,383

Int. Cl.³ F15C *1/118*

U.S. Cl. 137—842 **25 Claims**

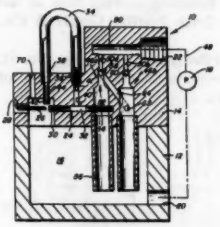
1. An apparatus for dispensing a precise volume of liquid, comprising:

emitter means for dispensing a stream of liquid to an appropriate collector, the emitter means including outlet restriction means for generating a positive pressure in the emitter means behind the outlet restriction means;

supply means for feeding liquid under pressure to said emitter means; and

time delay conduit means in communication with said emitter means behind said outlet restriction means for receiving liquid therefrom under the influence of said positive

pressure, the time delay conduit means being positioned for directing liquid received thereby against the stream of liquid dispensed by the emitter means and diverting the



stream of liquid away from said collector when the time delay conduit means becomes filled with liquid under pressure from the emitter means.

4,532,963

WEAVING MECHANISM WITH IMPROVED SELECTION OF THE HOOKS

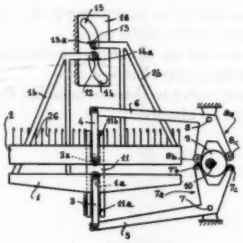
Patrick Bastion, Lyon; Francois Lhuillier, and Ulrich Mutschler, both of Caluire, all of France, assignors to Societe Staubli-Verdol, Lyon, France

Filed Nov. 2, 1983, Ser. No. 548,118

Claims priority, application France, Nov. 4, 1982, 82 18725

Int. Cl.³ D03C *3/00, 3/20, 13/00*

U.S. Cl. 139—59 **11 Claims**



1. An improved mechanism for selectively raising the heddle hooks of a weaving loom in response to control signals delivered by a pattern reader, the improvements comprising:

(a) a lower plate supporting the heddle hooks with their upper ends extending freely through the plate, the upper end of each hook having a beak thereon;

(b) an upper plate disposed above the lower plate;

(c) means for vertically reciprocating the plates oppositely to one-another in synchronism with the loom; and

(d) selection means mounted on and moving with the upper plate above the hooks and comprising, a flexible blade for each hook having a catch at its lower end disposed to engage and catch the beak of the associated hook to raise it when the plates reciprocate apart, a ramp associated with each hook and disposed to offset the lower end of the blade to a defelected position wherein the catch is spaced away from the beak when the plates are reciprocated closest together, the blade leaving the ramp as the plates begin to separate, and electrical means operative in response to said control signals for selectively retaining each blade in deflected position offset from the beak of the associated hook or for releasing the blade to engage the beak as the plates separate.

4,532,964

METHOD OF OPERATING AN AIR NOZZLE WEAVING MACHINE

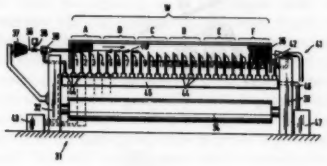
Hansueli Lerch, Elgg, Switzerland, assignor to Gebrüder Sulzer Aktiengesellschaft, Winterthur, Switzerland

Filed Nov. 21, 1983, Ser. No. 554,077

Claims priority, application European Pat. Off., Dec. 24, 1982, 82810564.3

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **10 Claims**



1. A method of operating an air nozzle weaving machine containing air-operated weft insertion means and comprising auxiliary nozzles distributed across a predetermined weaving width, comprising the steps of:

cutting-in said auxiliary air nozzles to generate a pressure wave travelling through a weaving shed of the weaving machine together with a front end of a weft thread which is to be inserted through said weaving shed;

cutting-off those ones of said auxiliary nozzles which have been passed by said front end of said weft thread prior to completion of the weft insertion;

again cutting-in at least one of said auxiliary nozzles which have been passed by said front end of said weft thread prior to completion of the weft insertion in order to support said weft thread; and

again cutting-off said at least one renewed cut-in auxiliary nozzle prior to completion of said weft insertion.

4,532,965

WEFT YARN PICKING CHANNEL

Paul Lincke, Zell, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 31, 1983, Ser. No. 528,119

Claims priority, application Switzerland, Sep. 14, 1982, 5437/82

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **19 Claims**

1. A weft yarn picking channel for a pneumatic weaving machine, said channel including a sley and a plurality of discrete guide elements disposed on said sley in longitudinally disposed parallel relation, each said guide element being a one-piece wire structure of uniform cross-section having a

hook-shaped part mounted in and extending from said sley to form a guide for a weft yarn whereby said guide elements

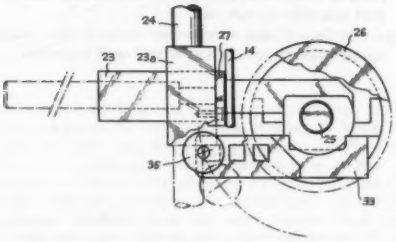
define a picking path for picking of a weft yarn independently of a reed.

4,532,966

DEVICE FOR PRODUCING AND REMOVING SHAPED WIRE MATERIAL PIECES

Bertrand L. de Bentzmann, Bragueze, 47800 Roumagne, France

Filed Apr. 7, 1983, Ser. No. 482,830
Claims priority, application France, Apr. 21, 1982, 82 06864
Int. Cl.[3] B21F *1/00*
U.S. Cl. 140—105 8 Claims



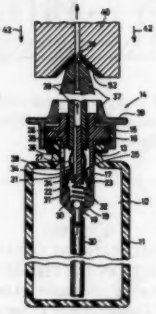
7. Device for receiving, cutting, shaping and discharging elongated wire or bar material workpieces, said device comprising a generally rectangular frame, a beam mounted along one longitudinal edge of said frame and carrying thereon measuring, cutting and shaping means for receiving said material workpieces, said frame further including a plurality of supporting legs for supporting said frame above the ground, said frame and said legs arranged to define a space beneath said frame configured to accommodate receptacle means movable between receiving and discharing positions, to receive and selectively discharge shaped material workpieces from said device, and a receptacle means comprising a movable tray situated within the space beneath said frame.

4,532,967

METERING PUMP, AS WELL AS PROCESS AND APPARATUS FOR FILLING A CONTAINER EQUIPPED WITH A METERING PUMP

Lothar Graf, Rielasingen, Fed. Rep. of Germany, assignor to Firma Ing. Erich Pfeiffer GmbH & Co. KG, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,106
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225692
Int. Cl.[3] B65B *3/04*
U.S. Cl. 141—3 17 Claims



1. A process for filling a container provided with a discharge pump having a pump chamber and an outlet valve in an outlet passage thereof, and a filling medium to be disposed from the container, comprising the steps of:

filling the container with the filling medium;

fitting the pump tightly to an opening in the container;

opening the outlet valve of the pump;

exerting a vacuum on the outlet passage to draw the filling medium into the pump chamber; and,

closing the outlet valve to thereby maintain the filling medium in the pump chamber.

4,532,968

ROTARY FILLING APPARATUS AND METHOD

George E. Leonard, Bettendorf, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Jun. 23, 1983, Ser. No. 507,087
Int. Cl.[3] B65B *3/04*
U.S. Cl. 141—5 22 Claims

19. A method of the type which uses gravity for filling a liquid into a plurality of containers while they rotate about a rotary filling head, the method comprising:

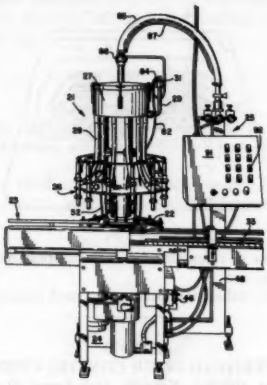
positioning a container to be filled onto a turntable;

rotating the turntable to bring the container into alignment with a dispensing nozzle;

flowing a predetermined amount of liquid from a reservoir and through the dispensing nozzle while the dispensing nozzle and the reservoir are rotating about a generally vertical axis;

sensing the level of liquid in the rotating reservoir, said sensing step taking place at a sensing location that is spaced from the generally vertical axis by a distance that is substantially the same as the distance between the generally vertical axis and the dispensing nozzle such that centrifugal force at the sensing location is substantially the same as that at said dispensing nozzle during rotation thereof;

adjusting the level of liquid within the rotating reservoir in response to the sensing step, whereby a substantially con-



stant hydraulic head is maintained within the rotating reservoir.

4,532,969

FLUID WITHDRAWAL AND INSTILLATION DEVICE

Hau C. Kwaan, 347 Jeffrey La., Northfield, Ill. 60093

Filed Sep. 21, 1983, Ser. No. 534,342
Int. Cl.³ B65B *3/02*
U.S. Cl. 141—27 **5 Claims**

1. A fluid withdrawal and instillation device for mounting a collecting means for the transfer of fluid from a first container to a second container, said device comprising:

an outer frame member having opposing side walls, an upper portion and a lower portion and containing as its lower portion, hollow attachment means for communication with a connecting portion of a fluid collecting means, a lower fluid passageway in alignment with and above said hollow attachment means, an air passage positioned in and through each opposing side wall of said outer frame member and first and second generally verticle passages positioned at and through the upper portion of said outer frame member;

a first hollow core needle vertically attached to the upper portion of said outer frame member such that the hollow core needle is in alignment with one passage in the upper portion of said outer frame member;

a second hollow core needle, in parallel alignment with said first hollow core needle and attached to the upper portion of said outer frame member such that the second hollow core needle is in alignement with a second passage in the upper portion of said outer frame member, said second hollow core needle being shorter in length than said first hollow core needles;

an inner, movable rotary core member, rotatably secured and in sealed communication with said outer frame member, said rotary core member having therein, a fluid passageway extending vertically therethrough and situated such that said fluid passageway is in alignment with the lower fluid passageway of said outer frame member, whether said rotary core member is in a switched position to withdraw or instill fluid and further situated such that said fluid passageway is in alignment with the second generally verticle passage in said outer frame member to which is attached the second hollow core needle when it is desired to withdraw fluid and which fluid passageway in said rotary core member is in moveably alternate alignment with the first generally verticle passage in said outer frame member to which is attached the first hollow core needle when said rotary core member is positioned so as to instill fluid, and which rotary core member also contains a first air passageway positioned such that when said rotary core member is positioned to withdraw fluid, air entering through a first air passage in said outer frame member enters said first air passageway and passes through the first generally verticle passage in the upper portion of said outer frame member and through the first hollow core needle attached thereto, and which rotary core member also contains a second air passageway positioned such that when said rotary core member is positioned to install fluid, displaced air passes through said second hollow core needle, through said second generally verticle passage in the upper portion of said outer frame member through said second rotary core air passageway and exits through a second air passage in said outer frame member;

positioning means whereby said rotary core member is restrainably aligned in the desired position, to withdraw and instill fluid; and

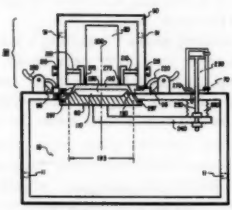
means on said rotary core member member for the manual rotation thereof to the desired position.

4,532,970

PARTICLE-FREE DOCKABLE INTERFACE FOR INTEGRATED CIRCUIT PROCESSING

Barclay J. Tullis, Palo Alto; Mihir Parikh, San Jose; David L. Thrasher, Menlo Park, and Mark E. Johnston, Saratoga, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 28, 1983, Ser. No. 536,600
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—98 **1 Claim**



1. An interface between first and second containers comprising:

alignment means for orienting the first container in a fixed position relative to the second container;

a first door for independently sealing the first container;

a second door for independently sealing the second container;

said first and second doors each having a closely contacting

mating outer surface of substantially equal exterior dimensions, so that substantially all particulate contamination which has accumulated on the exterior surface of the doors when the containers are separated will be trapped between said doors when the containers are positioned together with said alignment means;

a gutter around the lower perimeter of the lower of the first and second doors; and

elevator means coupled to said doors for transporting said doors while coupled together at their mating outer surfaces into said containers as a single unit.

4,532,971

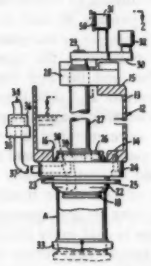
HIGH SPEED VACUUM SYRUPER

Konrad E. Meissner, Lafayette, Calif., assignor to Atlas Pacific Engineering Company, Emeryville, Calif.

Filed May 6, 1983, Ser. No. 492,407

Int. Cl.³ B65B *57/04*

U.S. Cl. 141—142 **4 Claims**



1. In a high speed vacuum syruper for containers having a bowl carrying filling fluid, a plurality of filling valves mounted on the bottom of said bowl, each filling valve having a valve element that rotates about a vertical axis, means for rotating said bowl and filling valves about a common vertical axis, means for moving a container into and out of engagement with each filling valve, and a control means for manipulating each filling valve in a repeating sequence through closed, vacuum, fill and vent positions, the improvement wherein said control means comprises:

a pair of horizontally displaced upper and lower cam followers connected to each valve element, the upper cam follower of each pair being rotatable in a common horizontal first path, the lower cam follower of each pair being rotatable in a common horizontal second path displaced from said first path; and

a control camming means comprising a pair of horizontally displaced upper and lower cam tracks, said upper cam track being engagable by said upper cam followers and said lower cam track being engagable with said lower cam followers as said bowl rotates about the common vertical axis.

4,532,972

PURSE ORGANIZER

George V. Sinsko, Rte. 2, Box 158A, Russell Springs, Ky. 42642

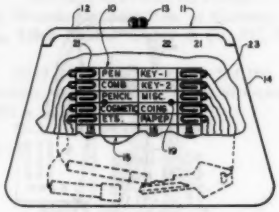
Filed Sep. 20, 1984, Ser. No. 652,227

Int. Cl.³ A45C *1/02, 3/06, 13/02, 13/06*

U.S. Cl. 150—100 **4 Claims**

1. A device for rapidly locating articles contained within a purse and removing said articles from the purse comprising:

(a) an indicator panel of substantially rectangular configuration having a flat center portion provided with mounting holes, and flat vertically disposed coplanar end strips laterally displaced from said center portion as continuous integral extensions thereof,



(b) a number of releasable fasteners adapted to engage said end strips, and

(c) a flexible tether line attached to each fastener.

4,532,973

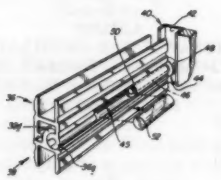
OVERHEAD DOOR CONSTRUCTION

Ralph DeFalco, 10320 S. Kenneth, Oak Lawn, Ill. 60453

Filed Jun. 15, 1983, Ser. No. 504,445

Int. Cl.³ E06B *3/12*

U.S. Cl. 160—235 **16 Claims**



1. An upwardly acting overhead door which is adapted to be rolled along an L-shaped track between a substantially vertical closed position and a substantially horizontal storage position, said door having an outer face and an inner face, and said door including:

a plurality of adjacent laterally-extending door panel sections in edge-to-edge arrangement; and

hinge means sets for interconnecting adjacent panel sections along adjacent lateral edges thereof; wherein the improvement comprises:

each of said hinge means sets comprising a male member and a female member positioned between the side edges of said panels and between the inner and outer faces;

one of said male and female members being secured to the lower edge of the upper of the adjacent door sections and the other of said male and female members being secured to the upper edge of the lower of said adjacent door sections;

said male and female members defining separable hinge knuckle means which interconnect so as to hingedly interconnect the door sections along the lateral edges of said door sections;

said hinge means defining a door roller assembly receiving section at each lateral edge; said section being formed by the outboard end of the female member and an inwardly spaced terminal end of the male member;

wherein said inner door face is substantially smooth so as to minimize snagging of said door; and

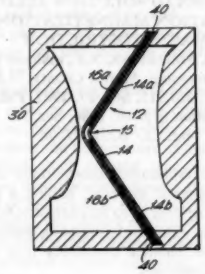
wherein there is further provided a plurality of roller assembly means, each adapted for mounting in said door roller receiving section, each of said roller assembly means including a shaft having a roller mounted thereon, said shaft being of a length less than the distance between the door's lateral edge and the inwardly spaced terminal end of said male member, a bearing sleeve constructed to fit

within and be retained within said female member and being of a length substantially equal to that of the shaft and removable retainer means constructed to fit between said male member's terminal end and sleeve bearing and shaft to maintain the shaft and bearing sleeve in place during use.

4,532,974
COMPONENT CASTING

David Mills; Anthony T. Lindahl, and Alan D. Kington, all of Bristol, England, assignors to Rolls-Royce Limited, London, England

Filed Jun. 30, 1982, Ser. No. 393,549
Claims priority, application United Kingdom, Jul. 3, 1981, 8120598
Int. Cl.³ B22D *29/00*
U.S. Cl. 164—132 **11 Claims**



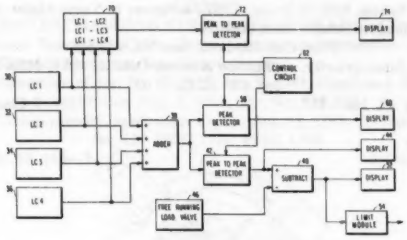
1. A method of casting a nickel- or cobalt-based superalloy component comprising the steps of:
(a) making a mold having a casting cavity in the shape of the component to be cast;
(b) locating a core within said casting cavity, said core comprising:
(i) a hollow member, said hollow member comprising two straight leachable ceramic refractory material portions interconnected by a bend; and,
(ii) a ceramic support member, said ceramic support member comprising material of greater refractoriness than said material of said hollow member, wherein said support member comprises two straight portions extending into said hollow member from opposite ends thereof and terminating adjacent said bend, and wherein said hollow member has a larger inside diameter than the diameter of said support member at the operating temperature of the core;
(c) filling the mold with molten superalloy component material and allowing the superalloy component material to solidify; and,
(d) removing the core from the component by withdrawing said support member portions from opposite ends of said hollow member and subsequently leaching said hollow member from the component.

8. A mold for casting nickel- or cobalt-based superalloy, said mold comprising a core for defining a passage in a nickel- or cobalt-based superalloy casting component, said core comprising:
(a) a hollow member, said hollow member comprising leachable ceramic refractory material, wherein said hollow member comprises two straight portions interconnected by a bend; and,
(b) a ceramic support member, said ceramic support member comprising material of greater refractoriness than said material of said hollow member, wherein said ceramic support member comprises two straight portions extending into opposite ends of said hollow member and terminating adjacent said bend; and wherein said hollow member has a larger inside diameter than the diameter of said support member at the operating temperature of the core.

4,532,975
CONTINUOUS CASTING MOLD OSCILLATOR LOAD INDICATION SYSTEM

Kenneth D. Ives, Valparaiso, Ind., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1983, Ser. No. 489,619
Int. Cl.³ B22D *11/16*
U.S. Cl. 164—150 **20 Claims**

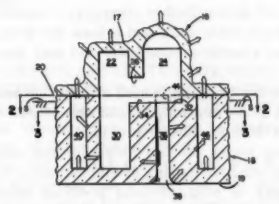


16. A continuous casting mold oscillator load indicating system for use in a continuous casting apparatus of the type including a mold for containing mold contents, oscillating means for imparting an oscillating motion to said mold and means for providing at least one signal having a component representing friction betwen said mold and said mold contents, said signal varying in magnitude over the course of a single oscillation cycle of said mold, said system further comprising means for monitoring the peak-to-peak value of said signal.

4,532,976
GAS PERMEABLE METAL CASTING MOLD HAVING GAS COLLECTION VOIDS

George D. Chandley, Amherst, N.H., assignor to Hitchiner Manufacturing Co., Inc., Milford, N.H.

Filed Jun. 13, 1984, Ser. No. 620,314
Int. Cl.³ B22C *9/08*
U.S. Cl. 164—363 **10 Claims**



1. In a unitary, rigid, self-supporting, gas permeable, low temperature bonded, sand grain mold having peripheral side surfaces extending between vertically spaced upper and lower surfaces with mold cavity means spaced therebetween connected to gate passage means having its lower open end exposed at said lower surface,
said mold cavity means being adapted to be filled with molten metal through said gate passage means by applying reduced pressure to the top surface of said mold while its lower surface with said gate passage means lower open end is submerged in molten metal,
that improvement comprising
enclosed gas collection void means adjacent to and spaced

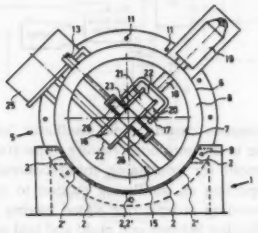
from said cavity means, gate passage means and upper and lower mold surfaces for collecting gases from said cavity means and gate passage means during filling of said cavity means for controlled removal of said gases from said void means through said upper mold surface by said application of reduced pressure thereto.

4,532,977

CONTINUOUS CASTING INSTALLATION

Hermann Schubert, Linz, Austria; Max Ahrens, and Manfred Haissig, both of Irvine, Calif., assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Oct. 15, 1982, Ser. No. 434,620
Claims priority, application Austria, Oct. 16, 1981, 4453/81
Int. Cl.³ B22D 11/00
U.S. Cl. 164—442 7 Claims



1. In a horizontal continuous-casting installation comprising a take-off device for a casting having a longitudinal axis, said take-off device being supported on a frame and including

at least one drive roll having an axis and being secured to a drive shaft, said at least one drive roll being adapted to be driven by a motor means, and

at least one counter-pressure roll having an axis and an associated press-down device, said counter-pressure roll being adapted to be urged toward said drive roll by said press-down device,

preferably said axis of said at least one drive roll and said axis of said at least one counter-pressure roll being parallel, the improvement wherein,

said take-off device further comprises a mounting for supporting said drive shaft, said at least one drive roll, said at least one counter-pressure roll and said press-down device,

said mounting being supported relative to said frame for rotation about said longitudinal axis of said casting, and wherein there are further provided

cooperating means on said mounting and said frame for enabling selective locking of said mounting in any one of a plurality of predetermined positions relative to said frame.

4,532,978

ROLL FOR TRANSFERRING HOT METAL PIECES

Hironori Kuroki; Tsuguo Honda, and Toshihisa Mitsui, all of Fukuoka, Japan, assignors to Kuroki Kogyosho Co., Ltd., Kitakyushu, Japan

Continuation of Ser. No. 382,446, May 26, 1982, abandoned.
This application Apr. 16, 1984, Ser. No. 600,211
Int. Cl.³ B22D 11/128
U.S. Cl. 164—448 10 Claims

1. A roll for transfering hot metal pieces of which the surface layer part comprises a ferritic steel consisting essentially of less than 0.1 percent by weight of carbon, 10.0–14.0 percent by

weight of chromium, 0.4–1.0 percent by weight of columbium and the balance iron.

4,532,979

IRON-BORON SOLID SOLUTION ALLOYS HAVING HIGH SATURATION MAGNETIZATION AND LOW MAGNETOSTRICTION

Ryusuke Hasegawa, Morristown, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 423,915, Sep. 27, 1982, Pat. No. 4,483,724.
This application Sep. 10, 1984, Ser. No. 648,563
Int. Cl.³ B22D 11/06
U.S. Cl. 164—463 2 Claims

1. A process for fabricating substantially continuous filaments of a ferromagentic material, having a high saturation magnetization, low or near-zero magnetostriction and having a body centered cubic structure, consisting essentially of 1 to 3 atom percent boron, balance essentially iron plus incidental impurities, which comprises

(a) forming a melt of the material;

(b) depositing the melt on a rapidly rotating quench surface; and

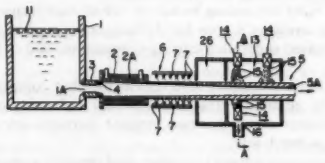
(c) quenching the melt at a rate of about 10^4 to $10^{6°}$ C./sec to form the continuous filament.

4,532,980

METHOD AND APPARATUS FOR REMOVING FINE COLD SHUT CRACKS ON HORIZONTALLY AND CONTINUOUSLY CAST STEEL STRAND USING EJECTION OF A PLURALITY OF METAL SHOTS

Yoshiharu Miyawaki, 4-1, Kitayoshizu-cho, Fukuyama City, Hiroshima Pref.; Takeshi Hirose, 1-2-19, Fujimi, Chiyoda-ku, Tokyo; Yoneichi Hamada, 1665-4, Zao-Cho, Fukuyama City, Hiroshima Pref.; Seishi Mizuoka, 161-38, Tsunoshita, Daimon-cho, Fukuyama City, Hiroshima Pref., and Masahiro Tsuru, 4-34-1, Kishiya, Tsurumi-ku, Yokohama City, Kanagawa Pref., all of Japan

Filed Oct. 11, 1983, Ser. No. 540,835
Claims priority, application Japan, Oct. 12, 1982, 57-178884; Jul. 22, 1983, 58-134189
Int. Cl.³ B22D 11/10, 11/12
U.S. Cl. 164—475 12 Claims



1. A method for removing fine cold shut cracks on a horizontally and continuously cast steel strand using ejection of a plurality of metal shots, which comprises:

horizontally and intermittently withdrawing a cast steel

strand from a horizontal mould fitted to the lower portion of the side wall of a tundish containing molten steel by a plurality of cycles each comprising a pull and a push;

spraying cooling water, in a cooling zone provided following said horizontal mold on the same horizontal level as that of said horizontal mold, onto the surface of a solidified shell of said cast steel strand passing through said cooling zone, to cool said cast steel strand;

continuously ejecting a plurality of metal shots, in a shooting zone provided following said cooling zone on the same horizontal level as that of said cooling zone, onto the surface of said solidified shell of said cast steel strand passing through said shooting zone, to weld fine cold shut cracks produced on the surface portion of said solidified shell of said cast steel strand by said plurality of cycles each comprising a pull and a push under the pressure applied by means of said plurality of metal shots thus ejected, to remove said fine cold shut cracks;

discharging, after said ejection onto the surface of said solidified shell of said cast steel strand, said plurality of metal shots from said shooting zone; and,

directing said plurality of metal shots discharged from said shooting zone into said shooting zone for reuse in recycle;

characterized by:

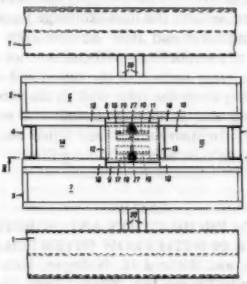
providing a heat-restoring zone, substantially on the same horizontal level as that of said cooling zone and said shooting zone, between said cooling zone and said shooting zone, where the temperature of the surface portion of said solidified shell of said cast steel strand passing through said heat-restoring zone is re-increased with the use of heat of molten steel in the interior of said cast steel strand, to soften the surface portion of said solidified shell of said cast steel strand, thereby facilitating said welding and said removal of fine cold shut cracks in said shooting zone.

4,532,981

CONTINUOUS CASTING PLANT

Reinhard Hargassner, Linz, Austria; Thomas J. Nugent, Oakland, N.J.; Alois Scheinecker, Linz, and Kurt Engel, Leonding, both of Austria, assignors to Voest Alpine International Co., New York, N.Y.

Filed Jun. 3, 1983, Ser. No. 500,935
Int. Cl.³ B22D *11/08, 11/14*
U.S. Cl. 164—483 **7 Claims**



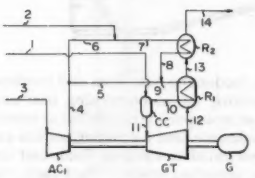
1. In a continuous casting machine to be used for selectively casting a single strand having slab cross section or at least two strands having smaller cross sections, and of the type including a plate mold having side walls and end walls including side wall copper plates and end wall copper plates, a support frame surrounding said mold and carrying said side and end walls, and further intermediate end walls having copper plates provided between said end walls for casting at least two strands, the improvement which comprises a hollow body carrying said intermediate end wall copper plates on both sides and inserted between said side wall copper plates, means for supplying a coolant flowing through said hollow body, supporting elements overlapping said side walls and supporting, on said side walls, said hollow body on its upper end, and coolant supply and discharge piping projecting from said support frame as far as into said hollow body and fixing said hollow body on its lower end, said coolant supply and discharge piping extending transversely to, and below, said side walls and being displaceable from an operating position projecting into said hollow body into a resting position releasing said hollow body.

4,532,982

HEAT EXCHANGING SYSTEM FOR A HEAT ENGINE

Hiromi Nakamura, Chiba, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 271,935, Jun. 9, 1981, abandoned. This application Aug. 8, 1983, Ser. No. 520,755
Claims priority, application Japan, Jun. 11, 1980, 55-78808
Int. Cl.³ F02C *3/20;* **F02G** *1/00*
U.S. Cl. 165—1 **5 Claims**



1. A heat exchange method wherein a part of a compressed gas from compressor means is fed to a first heat exchange means and a separate part of the compressed gas from the compressor means is fed to a second heat exchange means operating at a temperature that is lower than said first heat exchange means, the improvement comprising the step of adding water to said separate part of the compressed gas to form a mixture of compressed gas, steam and liquid water and feeding said mixture to said second heat exchange means where the water in said mixture will absorb a large quantity of heat from said second heat exchange means through evaporation thereof, the mixture then being mixed with the first part of the compressed gas so as to recover heat in the first heat exchange means.

4,532,983

WATER CURTAIN APPARATUS FOR HEAT ENERGY RECOVERY FROM ESCAPING STEAM

Norman F. Bradshaw, Surrey, England, and Gerald P. Schrubba, Huntington Woods, Mich., assignors to Haden Schweitzer Corporation, Madison Heights, Mich.

Division of Ser. No. 218,393, Dec. 19, 1980, Pat. No. 4,402,332. This application Jun. 6, 1983, Ser. No. 501,710
The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.
Int. Cl.³ B08B *3/02*
U.S. Cl. 165—47 **1 Claim**

1. In a pretreatment facility for treating the surfaces of workpieces prior to a coating operation, said facility including a tunnel-like enclosure having an open entrance at one end for admitting workpieces and an open exit at an opposite end for exiting workpieces, said tunnel being of sufficient length to accommodate at least several said workpieces simultaneously therewithin, and means for spraying hot solution onto the workpieces within the enclosure, the improvement which comprises:

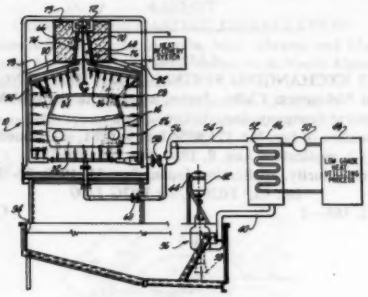
first conduit means framing a substantial portion of said entrance;

second conduit means framing a substantial portion of said exit;

means for supplying relatively cold water to said first and second conduit means;

nozzle means associated with each of said conduit means and directed across said entrance and exit for creating spray curtains within said entrance and exit, respectively;

means for catching condensate formed by the mingling of the spray curtains and steam within said enclosure; and



means for recovering heat from said condensate

said recovering means comprising heat exchanger means having an input portion connected to receive and circulate said condensate, and an output portion connected to receive and circulate a second fluid, said input and output portions providing separate fluid paths but being operatively linked in heat transfer relation whereby heat from said condensate is effectively transferred to said second fluid for subsequent utilization.

4,532,984

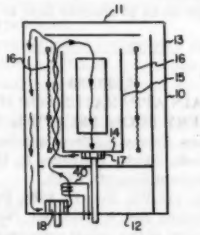
RAPID COOL AUTOCLAVE FURNACE

Charles W. Smith, Jr., Fairview, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.

Filed Jun. 11, 1984, Ser. No. 618,930

Int. Cl.³ F25B *29/00*; A21B *1/00*; F27B *5/04*

U.S. Cl. 165—61 **18 Claims**



1. An apparatus for gas pressure bonding, hot isostatic pressing or the like in which a workpiece may be treated at elevated temperatures and pressures, said apparatus comprising a pressure vessel having an elongate cylindrical wall for enclosing a furnace; a furnace comprising an insulated bottom and an insulated hood with openings near the top and bottom thereof, said insulating hood resting upon the bottom for enclosing a workspace, means for heating the workspace, means for cooling the wall of the pressure vessel, means for establishing a first circulating flow of pressurized fluid down along the interior of the pressure vessel wall, means for establishing a second circulating flow of pressurized fluid down through the workspace, means for causing exchange of heat between the two circulating flows of pressurized fluid after the first flow has been cooled by flowing down along the interior wall of the pressure vessel and after the second flow has been heated by flowing down over the workpiece in the workspace, and means for positively establishing the flow rate of at least one circulating flow of pressurized fluid.

4,532,985

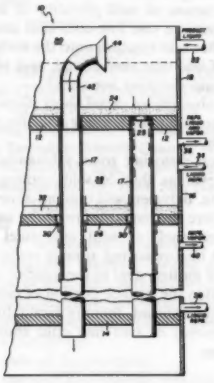
FALLING FILM HEAT EXCHANGER

Donald R. Cutler, Bolingbrook, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 20, 1983, Ser. No. 459,474

Int. Cl.³ F28D *3/00*

U.S. Cl. 165—118 **10 Claims**



1. A falling film heat exchanger comprising:

a plurality of spaced apart vertical tubes secured in, and with the tube ends penetrating, an upper and lower tube sheet;

a shell around the tube sheets and connected thereto;

means defining a feed box for containing a liquid pool above the upper tube sheet in communication with the upper ends of the tubes;

means to deliver a liquid feed stream into the feed box;

means to deliver a heat exchange liquid around the tubes inside of the shell between the upper and lower tube sheets and means to remove the heat exchange liquid therefrom;

means blocking all liquid flow downwardly through the upper ends of the tubes except for an interior circular area adjacent the inner surface of the tubes; and

means extending from the tube wall to the blocking means and spanning and extending around the entire interior circular area for distributing feed liquid along the inner surface of each tube as a thin falling film.

4,532,986

BITUMEN PRODUCTION AND SUBSTRATE STIMULATION WITH FLOW DIVERTER MEANS

Donald S. Mims, and Richard H. Widmyer, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 5, 1983, Ser. No. 491,832

Int. Cl.³ E03B *3/11*

U.S. Cl. 166—50 **6 Claims**

1. Well completion for a substrate layer holding viscous hydrocarbons which are produced in response to thermal stimulation of the substrate through the injection of a hot stimulating fluid therein, which completion includes;

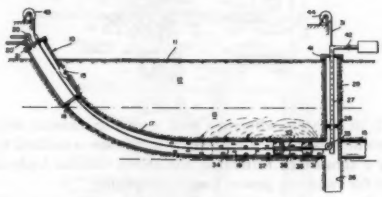
an elongated well liner at least a portion of which is disposed in a first well bore formed within the substrate, said at least portion of said elongated well liner being perforated and extending in a substantially horizontal alignment

through said substrate layer to receive a flow of hydrocarbon emulsion, and having a well head forming a liner production end,

at least one secondary well in the substrate and terminating with its lower end in a region adjacent to a portion of the first well bore,

a substrate stimulating system including; a conduit means in said at least one secondary well which is adapted at one end to communicate with a source of a hot pressurized stimulating fluid, said conduit means other end opening adjacent to the first well bore whereby to introduce a pressurized flow of the hot stimulating fluid into the liner remote end,

flow diverter means movably positioned within said well liner and being actuatable between expanded and contracted modes to form a transverse barrier in the liner and to interrupt fluid flow therethrough,



flow diverter positioning means engaging said diverter means and being operable to controllably adjust the diverter means' location along the liner length thereby to alter the flow of stimulating fluid into the substrate, said flow diverter positioning means includes;

a discontinuous cable means extending through the respective first well bore and secondary well, and being connected to opposed ends of the diverter means whereby to reciprocally adjust the location of the diverter means within said liner and means to separately apply tension to the cable means in one of said wells while concurrently reducing tension to the cable means in the other well said discontinuous cable means being registered within said conduit means in said secondary well.

4,532,987

GEOTHERMAL EXPANSION SPOOL PISTON

Lehman T. Reed, 3505 Chester Ave., Bakersfield, Calif. 93301

Filed Feb. 21, 1984, Ser. No. 581,794

Int. Cl.³ E21B *33/03*

U.S. Cl. 166—75.1 **12 Claims**

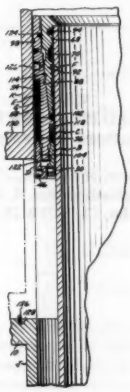
1. In a geothermal well that includes a well head through which a smooth external surfaced production casing that is anchored at the bottom extends upwardly for an end section of said production casing to be disposed above said well head, said section contracting and expanding longitudinally due to variations in temperature of said well, an expansion spool disposed above said well head, said expansion spool defining an upwardly extending smooth surfaced cylindrical passage of greater diameter than the external diameter of said end section and that extends completely around said end section when said expansion spool is mounted on said well head and secured thereto, the combination with said end section of a piston assembly removably mounted thereon that so supports packing that said packing may be manually adjusted to exert a sealing pressure of a desired magnitude on said cylindrical surface after a major portion of said piston assembly is in said passage and prior to said expansion spool being lowered onto said well head and secured thereto, said piston assembly including:

a. circumferentially extending mounting means that may be slid downwardly on said smooth external surfaced end section to a desired position thereon above said well head;

b. first means for removably securing said mounting means to said smooth external surfaced end section at said desired position;

c. first ring shaped resilient packing means that encircle said smooth external surfaced end section and are in abutting contact with said mounting means;

d. second means that are wrench operable and form a part of said piston assembly for longitudinally compressing said first packing means and radially deforming same into pressure sealing contact of a desired magnitude with said smooth external surfaced end section and said mounting means;



e. second ring shaped resilient packing means that encircle said smooth external surfaced end section and are disposed in abutting contact with said mounting means and having an external surface slightly smaller than that of said cylindrical passage; and

f. third means that form a part of said piston assembly that are wrench operable for longitudinally compressing said second packing means and radially deforming the same into pressure sealing contact of a desired magnitude with a portion of said expansion spool that defines said cylindrical passage and with said mounting means when at least a major portion of said piston assembly is within said cylindrical passage in said expansion spool.

4,532,988

SUCKER ROD SCRAPER METHOD AND DEVICE

Alvin E. Hickman, Pampa, Tex., assignor to Walter Beal, Odessa, Tex.

Filed Sep. 15, 1983, Ser. No. 533,061

Int. Cl.³ B23K *31/02*

U.S. Cl. 166—176 **15 Claims**

1. A method of making and attaching a spiral scraper assembly onto the exterior of a sucker rod comprising the steps of:

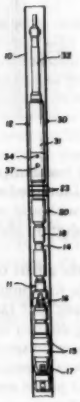
(1) forming a blade into a spiral which is wound about the surface of the rod;
(2) forming an inwardly directed tab at opposed marginal ends of the blade;
(3) placing a discontinuous U-band about the rod and at each marginal end of the spiral, and placing the confronting edges of the U-band closely adjacent to each of the tabs;
(4) placing a heat shield under the confronting marginal ends of the U-band; and,
(5) welding the opposed ends of the blade to the marginal ends of the U-bands.

4,532,989

VALVED PLUG FOR PACKER

James M. Barker, Carthage, Tex., assignor to Otis Engineering Corp., Dallas, Tex.

Continuation-in-part of Ser. No. 279,341, Jul. 1, 1981, abandoned. This application Mar. 1, 1982, Ser. No. 353,394
Int. Cl.³ E21B *23/06*
U.S. Cl. 166—188 **28 Claims**



1. A valved plug for coupling to the mandrel of a well packer comprising

a fixed component, and a component movable axially relative to said fixed component between valve closed and valve open conditions;

said fixed component comprising an elongated tubular member closed at its upper end, having means at its lower end for coupling to a packer mandrel in sealing relation;

said movable component comprising an elongated outer member including a tubular housing closed at its upper end, enclosing the upper portion of said fixed component, and an elongated inner tubular member disposed within said fixed component;

said fixed component and said movable component having lateral port means disposed to be communicated with each other in the valve open condition of said movable component, and to be sealed from each other in the valve closed condition of said movable component; and

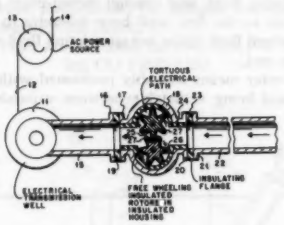
means coupling said elongated outer member with said elongated inner member forming said movable component into integral valve structure movable relative to said fixed component between said valve open and said valve closed conditions.

4,532,990

ISOLATION OF AN ELECTRICAL POWER TRANSMISSION WELL

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Co., Los Angeles, Calif.

Filed Jul. 1, 1983, Ser. No. 510,034
Int. Cl.³ E21B *43/25*
U.S. Cl. 166—248 **8 Claims**



7. In a system wherein a well is used to transmit alternating current power into a subsurface formation, a method for heating a subsurface formation containing viscous hydrocarbons and for reducing power losses comprising:

(a) connecting an inlet end of an internally electrically insulated housing and flow deflecting means to an inlet flowline;
(b) connecting an outlet end of said electrically insulated housing and flow deflecting means to an outlet flowline, said housing and flow deflecting means being adapted to conduct liquids from said inlet flowline to said outlet flowline and to cause said liquid to follow a tortuous path through said housing and flow deflecting means;
(c) installing inlet insulating means between said inlet flowline and said inlet end of said housing and flow deflecting means, said inlet insulating means being adapted to prevent electrical contact between said inlet flowline and said housing and flow deflecting means;
(d) installing outlet insulating means between said outlet flowline and said outlet end of said housing and flow deflecting means, said outlet insulating means being adapted to prevent electrical contact between said outlet flowline and said housing and flow deflecting means;
(e) connecting one of said flowlines to said well;
(f) flowing salt water through said inlet and outlet flowlines and in a tortuous path through said housing and flow deflecting means; and,
(g) simultaneously with step "(f)", applying alternating current electrical voltage to said well to add heat to said formation.

4,532,991

PULSED RETORTING WITH CONTINUOUS SHALE OIL UPGRADING

George R. Hoekstra, Wheaton, and John M. Forgac, Elmhurst, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

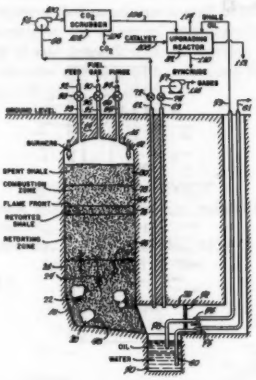
Filed Mar. 22, 1984, Ser. No. 592,375
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—261 **15 Claims**

1. A process for producing shale oil, comprising the steps of:

(a) retorting a rubblized mass of oil shale of an underground retort to a sufficient temperature to produce shale oil, water, and off gases from said oil shale leaving retorted shale containing residual carbon by
(1) combusting said residual carbon in said oil shale in a combustion zone behind a retorting zone in said underground retort with a flame front fed by a feed gas comprising air to produce combustion off gases comprising hydrogen, carbon dioxide, and substantial quantities of

nitrogen, said flame front advancing generally in the direction of flow of said fed gas;

(2) purging said retort with a purging fluid selected from the group consisting essentially of steam, water, hydrogen, hydrogen-rich gases, and combinations thereof to quench said flame front while continuing to produce shale oil, water, and purge mode off gases from said retort, said purge mode off gases produced during said purging comprising hydrogen, carbon dioxide, and miminal quantities of nitrogen, said purge mode off gases having a substantially higher concentration of hydrogen and a substantially lower concentration of nitrogen than said combustion off gases produced during said combusting; and



(3) subsequently reigniting said flame front;

(b) withdrawing said shale oil and water from said underground retort;

(c) substantially removing at least said carbon dioxide from said purge mode off gses;

(d) upgrading said shale oil with said purge mode off gases produced during said purging, in the absence of said combustion mode off gases, after said carbon dioxide has been removed from said purge mode off gases; and

(e) said combustion off gases having an excessive amount of nitrogen and an insufficient amount of hydrogen for use in upgrading said shale oil.

4,532,992

METHOD FOR RECOVERING PETROLEUM

Hubert Coenen, and Ernst Kriegel, both of Essen, Fed. Rep. of Germany, assignors to FRIED. KRUPP Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 406,052

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132755

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[3] E21B *43/24*

U.S. Cl. 166—267 **4 Claims**

1. Method for recovering petroleum from a deposit which has already been worked by primary extraction or is not suitable for primary extraction by extraction with a supercritical gas, comprising: introducing a gas in its supercritical state at a temperature which lies 10° to 100° C. above the critical temperature of the gas and at a pressure which lies 2 to 350 bar above the critical pressure of the gas through a bore hole into the deposit, wherein the supercritical gas becomes charged with petroleum to form a charged supercritical gas phase while the supercritical gas flows through the deposit; removing the charged supercritical gas phase from the deposit through a bore hole; and separating the petroleum from the charged supercritical gas into at least two separate fractions by stepwise pressure reduction and/or a change in temperature, characterized by introducing 8 to 10 kg of supercritical gas per liter of petroleum recovered.

4,532,993

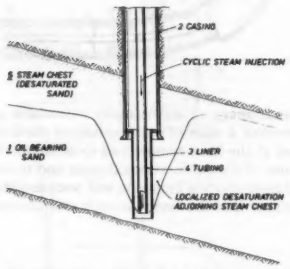
SELECTIVE STEAM FOAM SOAK OIL RECOVERY PROCESS

Richard E. Dilgren, Houston, Tex., and Paul B. Ritter, Bakersfield, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 7, 1983, Ser. No. 530,156

Int. Cl.[3] E21B *43/24*

U.S. Cl. 166—303 **4 Claims**



1. In an oil recovery process in which steam mixed with steam-foam-forming components is injected into a substerranean reservoir that contains a heavy oil and is susceptible to gravity override and, after a soak period, fluid is backflowed for production from the reservoir, an improvement which comprises:

mixing the steam injected into the reservoir with at least one each of noncondensible gas, monovalent cation salt and surfactant;

arranging the chemical compositions and proportions of the components mixed with the steam relative to both the quality of the steam and the chemical composition of the reservoir oil so that the foam formed by the mixture is significantly chemically weakened by contact with the reservoir oil; and

injecting the so-arranged mixture of steam and steam-foam-forming components and producing the fluid backflowed from the reservoir at rates and pressures such that the steam foam located within a zone of the reservoir in which the foam contacts a significant proportion of oil, tends to become chemically weakened and more mobile before the condensing of the steam from the gaseous component of the steam foam has become significant.

4,532,994

WELL WITH SAND CONTROL AND STIMULANT DEFLECTOR

Petre Toma; David A. Redford, both of Edmonton; Declan B. Livesey, Calgary, and Roy M. Coates, Ardrossan, all of Canada, assignors to Texaco Canada Resources Ltd., Calgary, Canada

Filed Jul. 25, 1983, Ser. No. 517,176

Int. Cl.[3] E21B *43/24*

U.S. Cl. 166—303 **7 Claims**

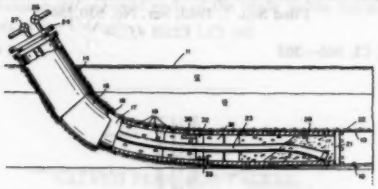
1. A well completion for producing hydrocarbons from a tar sand layer comprised of unconsolidated sand particles in which the hydrocarbon is releasably held, which well completion is registered within a wellbore disposed in a generally horizontal disposition along said tar sand layer, and including;

an elongated well liner having a perforated wall which is capable of transmitting a stream of hot stimulating fluid in one direction therethrough to penetrate said tar sand layer, and a flow of hydrocarbon emulsion together with

unconsolidated sand particles in a reverse direction through the wall and into the liner,

a well head at the upper end of said elongated well liner, and a transverse panel at the liner remote end forming at least a partial closure thereto,

a conductor depending from said well head and extending longitudinally of said liner and terminating in a discharge port adjacent to said panel,



and means forming a longitudinally extendable gravel pack comprised of a mass of unconsolidated particulate matter disposed at the liner remote end to substantially cover at least some of the perforations therein and to deter inward flow of hydrocarbon emulsion and unconsolidated particulate matter into the liner through said covered perforations.

4,532,995

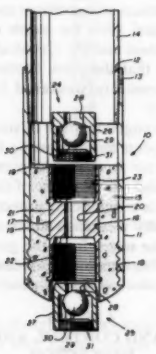
WELL CASING FLOAT SHOE OR COLLAR

Harry J. Kaufman, c/o Oilfield Supply Centre Ltd., Weatherford Oil Tools Ltd., P.O. Box 1518, Dubai, United Arab Emirates

Filed Aug. 17, 1983, Ser. No. 523,842

Int. Cl.³ E21B *34/06*

U.S. Cl. 166—327 **26 Claims**



1. A casing float tool for wells comprising

a tubular metal housing having internal threads at one end for connection in a casing string,

a mass of cementitious material supported on and extending inwardly from the inner wall surface of said housing and having a longitudinal passageway therethrough,

a tubular supporting member secured in and filling said cementitious passageway and having a passageway therethrough with externally unobstructed internally threaded opposite ends, and

check valves removably secured one in each of said unobstructed internally threaded ends of said tubular supporting member,

said check valves each comprising a tubular housing with external threads sized for securing said valves threadedly in said supporting member an removable therefrom without interference from said cementitious material or other structure in said housing, and

a check valve member closing in an upward direction and opening in a downward direction in each of said tubular valve housings.

4,532,996

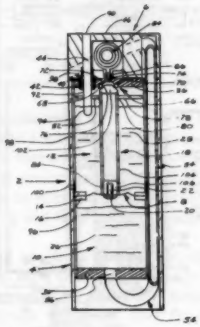
AUTOMATIC FIRE EXTINGUISHER WITH ACOUSTIC ALARM

Christopher W. Wilson; Thomas M. Trujillo, and Dennis M. Zallen, all of Albuquerque, N. Mex., assignors to The University of New Mexico, Albuquerque, N. Mex.

Filed Aug. 31, 1983, Ser. No. 528,315

Int. Cl.³ A62C *35/02*

U.S. Cl. 169—23 **10 Claims**



1. Fire extinguisher and alarm apparatus, comprising:

(a) a first reservoir;

(b) an orifice, connected to said first reservoir;

(c) fire detection means, connected to said orifice, for maintaining said orifice closed in the absence of fire, and for opening said orifice when said fire detection means is exposed to heat from a fire;

(d) a second reservoir, connected to a valve;

(e) a flexible diaphragm communicating on one side of said diaphragm with said first reservoir, and communicating on the opposite side of said diaphragm with said second reservoir;

(f) pressure coupling means, connected to said valve and to said first reservoir, for opening said valve when pressure is lost in said first reservoir;

(g) acoustic alarm means, connected to said second reservoir through said valve, for generating an audible alarm signal upon flow of fluid through said acoustic alarm means.

4,532,997

PROTECTIVE SYSTEMS

John R. Atherton, Corsham; John H. Sindall, Stourport-on-Severn, and Osmond R. Heathcock, Stourbridge, all of United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London and IMI Kynoch Limited, Birmingham, both of, England

Filed Oct. 4, 1979, Ser. No. 84,468

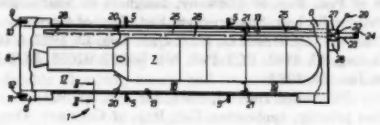
Claims priority, application United Kingdom, Oct. 4, 1978, 39317/78

Int. Cl.³ F42B *37/02*; A62C *37/04*

U.S. Cl. 169—56 **14 Claims**

1. Portable apparatus for storing a missile or torpedo, said apparatus comprising a rigid, protective container including supporting means for supporting therein, in a stable manner, a missile or torpedo, openable closure means through which said missile or torpedo can be loaded into, and removed from, the

container, an inlet in a wall of the container for the passage of an aqueous quenching fluid into the container from an external pressurised source of said quenching fluid, a valve which normally prevents flow of said quenching fluid into the container through said inlet, and adjacent to the interior of a wall



of said container detector means that will be penetrated by a projectile or fragment that penetrates a wall of the container, said detector means, in the event of, and immediately upon, such penetration of said detector means occurring, causing the valve to open thereby enabling said quenching fluid to flow into the container through said inlet.

4,532,998

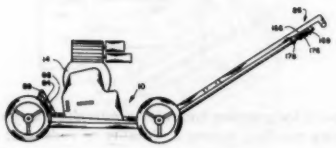
LAWN EDGER DEVICE

Roger H. Feikema, and Harry J. Bakker, both of 6050 Palmer Blvd., Sarasota, Fla. 33582

Filed Sep. 29, 1983, Ser. No. 537,072

Int. Cl.³ A01B *45/04*

U.S. Cl. 172—15 **19 Claims**



1. A lawn edger having a motor and a cutter blade and a handle mounted hand control for varying the depth of the cutter blade relative the ground, said edger comprising in combination:

a platform supporting said motor and cutter blade and having a first and a second end, said first and second ends of the platform being disposed in a plane which is angularly disposed relative to the longitudinal plane of the handle;

first wheel means connected relative to said first end of said platform for supporting said platform a fixed distance from the ground;

a first arm pivotally connected to said second end of the platform;

second wheel means for engaging the ground, said second wheel means being rotatable mounted relative said first arm;

a second arm rigidly connected to said first arm;

a connecting arm pivotally connected to said second arm;

a first portion of said connecting arm being disposed adjacent the distal end of said second arm;

a second portion of said connecting arm angularly connected to said first portion;

a position retaining means rigidly connected to and extending from the platform for slidably supporting said second portion of said third arm; and

said second portion and said position retaining means cooperating together for variably adjusting the longitudinal disposition of said second portion relative said position retaining means, said second portion being connected to the hand control for varying the disposition of the platform relative the ground.

4,532,999

SOIL CULTIVATING MACHINE

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Netherlands

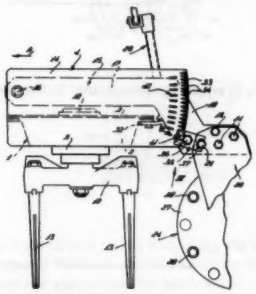
PCT No. PCT/NL82/00022, § 371 Date Mar. 2, 1983, § 102(e) Date Mar. 2, 1983, PCT Pub. No. WO83/00075, PCT Pub. Date Jan. 20, 1983

PCT Filed Jul. 2, 1982, Ser. No. 474,668

Claims priority, application Netherlands, Jul. 3, 1981, 8103195

Int. Cl.³ A01B *33/06, 49/02*

U.S. Cl. 172—68 **14 Claims**



1. A soil cultivating machine comprising soil cultivating members driven to rotate about upwardly extending axes and carried by a gear box extending transversely of the intended direction of operative travel and a roller located behind the cultivating members, said roller being arranged by means of carrying arms on said gear box so as to be adjustable in a direction of height, at least one end of said gear box comprising an end plate which is provided with a part extending above said gear box, a carrying arm for said roller having a lever part which is pivotally arranged on the side of said end plate's part facing inboard and a support part to which said roller is journalled and which is rigidly connected to said lever part so as to be outboard thereof and generally adjacent in a spaced edge-to-edge relationship with said end plate, and a locking element arranged between said end plate and said support part where they are in said relationship so that they are rigidly and releasably fastened together in a selected relative disposition for the desired adjusted height of said cultivating members relative to said roller.

4,533,000

SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7 Brüschenrain, Zug, Switzerland

Filed Jul. 21, 1983, Ser. No. 515,974

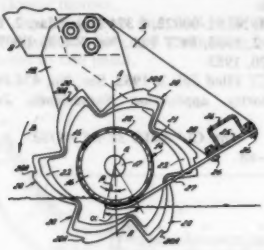
Claims priority, application Netherlands, Jul. 30, 1982, 8203046

Int. Cl.³ A01B *29/04*

U.S. Cl. 172—68 **25 Claims**

1. A soil cultivating implement comprising a packer roller to be used in combination with soil working members for crumbling and consolidating the worked soil to produce a seedbed optimum for germination and growth of seeds planted in said seedbed, the roller having a central supporting ground engaging means and a plurality of radially extending projections therefrom, each said projection exhibiting a substantially radially extending and relatively blunt surface that is resistant to forward progress through the soil and a substantially tangential and relatively sharp surface for penetrating into the ground, said projections arranged and constructed so that said blunt surfaces facilitate uniform rotation of said roller about its axis and said sharp surfaces facilitate penetration of said projections

into the ground, each of said projections including said blunt and sharp surfaces comprising two plates which interengage at



their peripheries in a plane perpendicular to the axis of rotation of said roller.

4,533,001

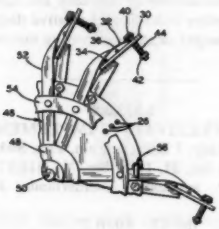
MULTIPLE FIXTURE FOR REPLACING WORN HOE BITS

Jack A. Tulen, R.R. #1, Coatsworth, Ontario, Canada NOP 1HO, and James L. Tulen, R.R. #1, Wheatley, Ontario, Canada NOP 2PO

Filed Jan. 13, 1984, Ser. No. 570,648

Int. Cl.³ B25B *1/20*; A01B *23/02*

U.S. Cl. 172—438 **19 Claims**



1. A fixture for welding a plurality of replacement spoons to worn free end portions of teeth of a rotary hoe wheel, the rotary hoe wheel having a hub from which the teeth extend in substantially uniformly spaced relationship around the hub, said hub also having a central shaft opening, said fixture comprising a hub, a shaft extending transversely outwardly from the center of the fixture hub, a plurality of mounting members supported outwardly beyond said fixture hub, there being one of said mounting members for each of the free end portions of the rotary hoe wheel, each of said members having means for supporting a replacement spoon thereon in a predetermined position.

4,533,002

DEVICE FOR GRIPPING AND RAISING TAMPING TOOLS OR FOR HOLDING RAISED TAMPING TOOLS IN A TAMPING MACHINE WHICH IS ESPECIALLY USED FOR THE PACKING OF COKING COAL

Kurt Leibrock, Völklingen, and Hans-Jürgen Killich, Sulzbach, both of Fed. Rep. of Germany, assignors to Saarbergwerke Aktiengesellschaft, Saarbrucken, Fed. Rep. of Germany

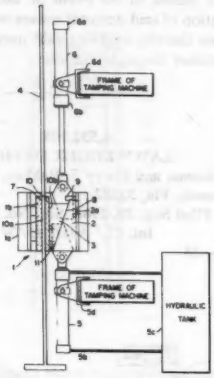
PCT No. PCT/DE81/00222, § 371 Date Aug. 13, 1982, § 102(e) Date Aug. 13, 1982, PCT Pub. No. WO82/02055, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 15, 1981, Ser. No. 407,921

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047339; Dec. 16, 1980, 3047400

Int. Cl.³ E21B *1/00*

U.S. Cl. 173—53 **13 Claims**



1. A device for gripping and raising individual tamping rods in a tamping machine having a plurality of rods, said device comprising:

body means for being disposed about an associated one of said plurality of rods, said body means having a first portion on one side thereof;

a first frictional gripping means connected to said first portion and being disposed substantialy within said body means;

a frictional, first inner surface on said first frictional gripping means for being substantially parallel to and for making frictional contact with a first side of its associated tamping rod;

a second portion of said body means forming a second inner surface, said second portion being on a side of said body means opposite said first portion;

a cavity being formed in said body means by said first inner surface and said second inner surface, said cavity having a shape which is at least a portion of a wedge, said wedge-shaped cavity comprising an upper portion, opening upwardly, and a lower portion, said first inner surface and said second inner surface having an angular relationship therebetween and converging from said upper portion of said cavity towards said lower portion of said cavity such that said first inner surface and said second inner surface are further apart at said upper portion than at said lower portion of said wedge-shaped cavity;

slidable clamping means being disposed at least partially within said wedge-shaped cavity;

a second frictional gripping means disposed for making frictional contact with said associated tamping rod on a second side thereof opposite to said first side of said associate tamping rod of said body means;

a first part of said slidable clamping means being disposed to act upon said second frictional gripping means so that said second frictional gripping means and said frictional, first

inner surface of said first frictional gripping means grip said associated rod when said slidable clamping means is seated within said wedge-shaped cavity;

a second part of said slidable clamping means for making contact with said second inner surface of said second portion of said body means when said slidable clamping means is seated within said wedge-shaped cavity;

means for moving said slidable clamping means upwardly within said wedge-shaped cavity with respect to said body means for releasing the frictional contact between said slidable clamping means and its said associated tamping rod whereupon said associated tamping rod falls substantially freely from said gripping device; and

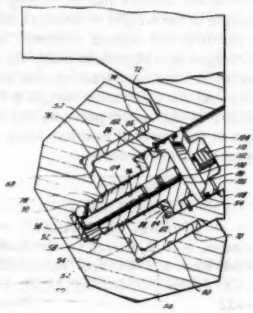
means for raising and lowering said body means.

4,533,003

DRILLING APPARATUS AND CUTTER THEREFOR

Thomas F. Bailey; John E. Campbell; Allen K. Rives, and Nehal M. Shah, all of Houston, Tex., assignors to A-Z International Company, Houston, Tex.

Filed Mar. 8, 1984, Ser. No. 587,490
Int. Cl.³ E21B *10/32, 10/22*
U.S. Cl. 175—269 **10 Claims**



1. A drilling apparatus comprising

a body having a bore therethrough and a longitudinal slot in its wall,

an arm mounted at its upper end to said body and having a pin extending from its lower end with a central bore therethrough,

a conical cutter having formation cutting means around its outer periphery, a small diameter threaded bore, and an enlarged diameter counterbore defining a shoulder between said threaded bore and said counterbore,

means extending through the pin bore of said arm and into said cutter bore to secure said cutter rotationally on said pin, and

thrust bearing means including a cup-shaped bearing surrounding said pin and engaging said counterbore and the shoulder between said counterbore and said cutter bore.

4,533,004

SELF SHARPENING DRAG BIT FOR SUB-SURFACE FORMATION DRILLING

Gunes M. Ecer, Irvine, Calif., assignor to CDP, Ltd., Newport Beach, Calif.

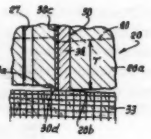
Filed Jan. 16, 1984, Ser. No. 570,860
Int. Cl.³ E21B *10/46*
U.S. Cl. 175—329 **29 Claims**

1. A self sharpening rotary drag bit assembly, comprising

(a) a carrier body adapted to be rotated about a first axis, and having a drilling end,

(b) cutters carried by the body to be spaced from one another and to be exposed for cutting at the drilling end of the body, the cutters having thereon layers of hard material defining cutting edges to engage and cut the drilled formation as the body rotates, the cutters also including reinforcement material supporting said layers to resist deflection thereof under cutting loads,

(d) said cutters being elongated in directions generally parallel to said axis, and extending individually in said body to be separated by body material, and to project at the cutting end of the body,



(e) the hardness of said layers exceeding the hardness of said reinforcement material, and the hardness of said reinforcement material exceeding the hardness of said body at the drilling end thereof,

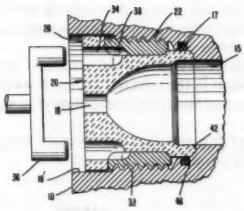
(f) whereby the hard material continually presents a cutting edge to the formation as the hard material, said reinforcing material, and said body abrade simultaneously, axially, during cutting.

4,533,005

ADJUSTABLE NOZZLE

Wilford V. Morris, Houston, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Nov. 21, 1983, Ser. No. 553,813
Int. Cl.³ E21B *10/60, 43/11*
U.S. Cl. 175—393 **17 Claims**



1. A nozzle adapted for connection within a cavity of a member to discharge a jet of fluid, said nozzle comprising:

a nozzle body formed of a hard material and including:

an outer flange,

a jet opening arranged to discharge fluid and to be reoriented in response to rotation of said nozzle body about a longitudinal axis thereof,

first tool receiving means for receiving a tool to manually rotate said nozzle body about said axis, and

a sleeve retained longitudinally upon said nozzle body and being rotatable relative to said nozzle body, said sleeve including:

coupling means located inwardly behind said flange for coupling said nozzle to the cavity of the member in response to rotation of said sleeve, and

second tool receiving means, such that the tool is engage-

able with said second tool receiving means for rotating said sleeve to install said nozzle, and is engageable with said first tool receiving means and disengaged from said second tool receiving means for rotating said nozzle body relative to said sleeve to reorient said jet opening.

4,533,006

COMBINATORIAL MEASURING METHOD AND APPARATUS

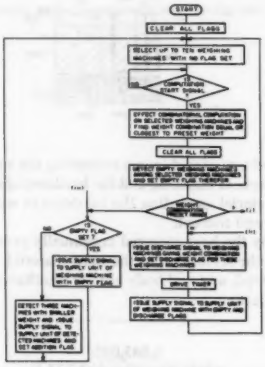
Kazukiyo Minamida, and Yoshiharu Asai, both of Shiga, Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Apr. 29, 1983, Ser. No. 489,839

Claims priority, application Japan, Apr. 30, 1982, 57-73656; May 10, 1982, 57-78638

Int. Cl.³ G01G *19/22, 19/52*

U.S. Cl. 177—25 **10 Claims**


START
CLEAR ALL FLAGS
SELECT UP TO TEN WEIGHING MACHINES WITH 'NO FLAG' SET
COMPUTATION START SIGNAL
NO
YES
EFFECT COMBINATIONAL COMPUTATION ON SELECTED WEIGHING MACHINES AND FIND WEIGHT COMBINATION EQUAL OR CLOSEST TO PRESET WEIGHT
CLEAR ALL FLAGS
DETECT EMPTY WEIGHING MACHINES, SELECTED AMONG MACHINES USED IN COMPUTATION, AND SET EMPTY FLAG THEREFOR
SELECT EMPTY FLAG
IS EMPTY FLAG SET ?
NO
YES
ISSUE SUPPLY SIGNAL TO SUPPLY UNIT OF WEIGHING MACHINE WITH EMPTY FLAG
ISSUE DISCHARGE SIGNAL TO WEIGHING MACHINES HAVING WEIGHT COMBINATION AND SET DISCHARGE FLAG FOR THESE WEIGHING MACHINES
DRIVE TIMER
DETECT THREE MACHINES WITH SMALLER WEIGHT AND ISSUE SUPPLY SIGNAL TO SUPPLY UNIT OF SELECTED MACHINES AND SET ADDITION FLAG
ISSUE SUPPLY SIGNAL TO SUPPLY UNIT OF WEIGHING MACHINE WITH EMPTY AND DISCHARGE FLAGS

2. A combinatorial measuring method for measuring a total quantity of articles using weight data from a plurality of weighing machines, comprising the steps of:

(a) performing cycles of combinatorial computation by combining the weight data from a selected group of the weighing machines to determine the optimum combination from the selected group of weighing machines for which the total quantity is closest to a preset value within an allowable preset range;

(b) periodically detecting whether any of the weighing machines in the selected group of weighing machines used in the combinatorial computation in said step (a) is empty; and

(c) supplying articles to the empty weighing machines detected in said step (b).

4,533,007

COMBINATION WEIGHING SYSTEM WITH SPAN ADJUSTMENT DEVICE

Oren A. Mosher; Oren G. Mosher, both of Hayward, and Elwood S. Douglas, Orinda, all of Calif., assignors to Eagle Machinery Company, Oakland, Calif.

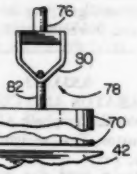
Division of Ser. No. 430,354, Sep. 30, 1982, Pat. No. 4,466,500. This application Mar. 16, 1984, Ser. No. 590,262

Int. Cl.³ G01G *23/01, 19/00, 23/14*

U.S. Cl. 177—50 **1 Claim**

1. In a weighing scale having a weighing tray structure for holding a product to be weighed, the tray structure being connected to a member strained by the weight of the tray sturcture and product during a weighing operation, signal generating means connected with the strained member for producing a signal representing the strain of the member caused by the tray structure and product, and calibration means for determining the parameters of tare and slope in the strain signal, the calibration means including a calibration weight of known amount, actuator means for lowering the calibration weight to a lowered position on the tray structure and forming a part of the weight thereof and for lifting the calibration weight to a raised position of the tray structure and free thereof, the improvement comprising:

a coupling connected between the actuator means and the calibration weight and having a first depending link member connected to the actuator means and a second link member coupling to and totally interlocking with the first



link member, the second member also forming part of the weight of known amount and projecting rigidly upward from a portion of the weight to interlock with the first link member, the first and second members being shaped to draw the weight into alignment under the actuator when the link members are in contacting and load transmitting relationship and the calibration weight is lifted off of the tray structure in the raised position, the members being disengaged in the lowered position when the calibration weight is on the tray structure.

4,533,008

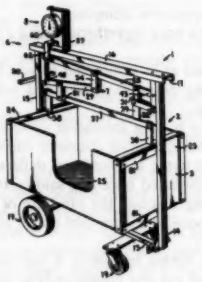
LIVESTOCK SCALE

Jerry L. Ostermann, R.R. 2, Sylvan Grove, Kans. 67481

Filed Mar. 6, 1984, Ser. No. 586,800

Int. Cl.³ G01G *19/52, 1/18, 21/28, 21/08*

U.S. Cl. 177—132 **14 Claims**



1. A livestock scale comprising:

(a) a weighing platform for receiving a load to be weighed:

(b) a support apparatus supporting said platform such that said platform is vertically movable relative to said support apparatus;

(c) a weighing mechanism cooperating with said platform for indicating the weight of a load received on said platform;

(d) said weighing mechanism including weight-transmitting means and weight-indicating means; and

(e) said weight-transmitting means comprising:

(1) a primary scale arm having first and second horizontally spaced locations therealong and being pivotally connected at said first location to said support apparatus;

(2) a secondary scale arm having third and fourth horizontally spaced locations therealong and being pivotally connected at said third location to said support apparatus; said first location being horizontally spaced from said third location;

(3) a primary hanging link being pivotally connected near one end thereof to said primary scale arm at said second location therealong; said primary hanging link being connected near another end thereof to said platform;

(4) a secondary hanging link being pivotally connected near one end thereof to said secondary scale arm at said fourth location therealong; said secondary hanging link being connected near another end thereof to said platform; said primary and secondary links being connected to said platform in horizontally spaced relationship relative to each other;

(5) a connecting link pivotally connecting said secondary scale arm and said primary scale arm, and being horizontally spaced from and positioned between said second and fourth locations; and

(6) said weight-indicating means being supported by said support apparatus and connected to said primary scale arm at a position therealong for indicating a weight in predetermined proportion to the weight of the load; such that a reaction force proportional to the weight being transferred to said weight-indicating means is transmitted through said primary and secondary hanging links and said connecting link to said secondary and primary scale arms, whereby the weight of the load is proportionally indicated by said weight-indicating means.

4,533,009

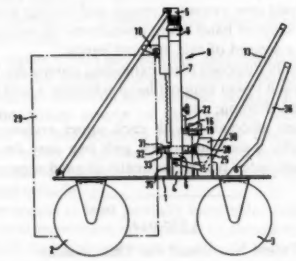
LIFTING AND TRANSPORTING DEVICES

David L. Evans, Hazeldene Cottage, Ford Rd., Litton, Nr. Bath, Somerset, England

Filed Apr. 5, 1984, Ser. No. 596,913

Int. Cl.³ G01G *19/08, 23/02*

U.S. Cl. 177—139 **7 Claims**



1. A device for lifting and transporting heavy objects, comprising a base frame having ground wheels, an upper frame slidable vertically on said base frame and provided with means for clamping an object thereto, a manually operable lever pivotally mounted on said base frame for movement about a horizontal axis to raise said upper frame, and releasable means for locking said upper frame in its raised position, characterised in that the upper and base frames are provided with cooperating means operable automatically in response to upward movement of the upper frame into a first or transport position, to retain the upper frame in that position with the weight of the container transmitted directly to the base frame, and operable automatically in response to further upward movement of the upper frame beyond said first position into a second or weighing position to divert the entire weight of the container through weighing mechanism mounted on said upper frame.

4,533,010

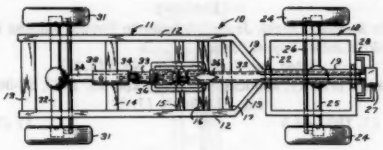
TRUCK HAVING A FRONT AXLE OSCILLATABLE RELATIVE TO A REAR AXLE

David Harder, 1100 Marron Cir., NE., Albuquerque, N. Mex. 87112

Filed Dec. 30, 1982, Ser. No. 436,276

Int. Cl.³ B62D *53/02*

U.S. Cl. 180—41 **8 Claims**



5. A vehicle which has a main frame supported on at least one axle, a sub-frame secured to said main frame and supported on at least one axle, a transfer case, an engine and transmission, a rear drive shaft housing; the combination with said vehicle of a torque tube, and a locking mechanism therefor;

means by which said sub-frame is pivotally mounted respective to said main frame;

means by which said torque tube is attached to said drive shaft housing of said axle supporting said main frame, and is received in one end of said sub-frame for controlling the oscillation of said sub-frame and said supporting axle relative to said main frame and said supporting axle; means by which a pair of spaced sleeves are axially aligned and slidably mounted on said torque tube; a hydraulic cylinder secured to said main frame and to said sleeves whereby said sleeves and said hydraulic cylinder comprise a locking mechanism which controls the oscillation of said sub-frame.

4,533,011

HYBRID DRIVE FOR A VEHICLE, IN PARTICULAR AN AUTOMOBILE

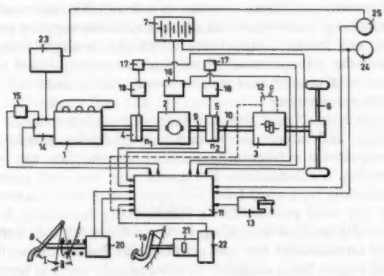
Paulus Heidemeyer, and Werner Zantopp, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Oct. 24, 1980, Ser. No. 200,427

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943554

Int. Cl.³ B60K *1/00*

U.S. Cl. 180—65.2 **33 Claims**



1. In a hybrid drive for a vehicle, for example, an automobile, with an electric engine which can be supplied energy from an electrical energy storage device and is capable of supplying energy back into said energy storage device, said electric engine being in connection with a driving axle of the vehicle by means of a first disconnecting clutch and with an internal combustion engine arranged in series therewith by means of a second disconnecting clutch, wherein depending on the need,

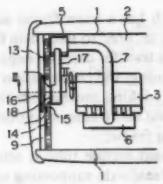
at least one of: neither of the two clutches, only one of the two clutches, and both clutches are engaged, the improvement wherein the internal combustion engine is designed without a flywheel and the flywheel mass required for its operation is an integral component of the rotating masses of the drive between the disconnection points of the two disconnecting clutches.

4,533,012

INTAKE DEVICE OF AN INTERNAL COMBUSTION ENGINE

Norio Komoda, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 7, 1983, Ser. No. 511,492
Claims priority, application Japan, Apr. 15, 1983, 58-065609
Int. Cl.³ B60K *13/02*
U.S. Cl. 180—68.3 **11 Claims**



1. An intake device of a motor vehicle having a pair of fender panels that define an engine compartment therebetween, a radiator support member which has a top face and extends between the fender panels for supporting a radiator; and an engine hood which has a bottom face approachable to the top face of the radiator support member when the engine hood covers the engine compartment, said intake device comprising:

first seal means arranged between the top face of said radiator support member and the bottom face of said engine hood and having a cutaway portion of a given transverse width;

second seal means arranged between the top face of said radiator support member and the bottom face of said engine hood and upstream of said cutaway portion; and

an air cleaner arranged within said engine compartment and having an air suction inlet disposed immediately behind said cutaway portion wherein

said first seal means comprises a pair of band-like seal members each having an inside end that defines said cutaway portion, said seal members extending along said radiator support member from the center of said radiator support member to the opposite ends thereof;

said second seal means consists of a band-like seal member extending transversely along said radiator support member and having a transverse width that is slightly larger than the transverse width of said cutaway portion such that said second seal means covers the entirety of said cutaway portion;

the top face of said radiator support member extends between and interconnects said pair of fender panels and comprises a substantially vertical intermediate top wall portion, a substantially horizontal rear top wall portion extending backward from an upper end of said intermediate top wall portion and a substantially horizontal front top wall portion extending forward from a lower end of said intermediate top wall portion, and the bottom wall of said engine hood comprises a substantially vertical bottom wall portion, a substantially horizontal rear bottom wall portion horizontally extending backward from an upper end of said vertical bottom wall portion and facing said horizontal rear top wall portion of said radiator support member, and a substantially horizontal front bottom wall portion which horizontally extends forward from a lower end of said vertical bottom wall portion and faces said horizontal front top wall portion of said radiator support member; and

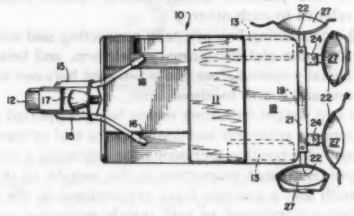
said first seal means is mounted so as to be secured between said horizontal rear top wall portion of said radiator support member and said horizontal rear bottom wall portion, and said second seal means is arranged between said horizontal front top wall portion of said radiator support member and said horizontal front bottom wall portion of said engine hood.

4,533,013

MOTORIZED GOLF CART

James H. Hightower, 1338 Patuxent Dr., Olney, Md. 20861

Filed Jun. 30, 1983, Ser. No. 509,377
Int. Cl.³ B62D *61/08*
U.S. Cl. 180—210 **1 Claim**



1. A motorized cart having a vertically disposed rear wall and a golf bag carrier appurtenance therewith, the appurtenance comprising:

(1) a vertically oriented post supported exteriorly on a central section of said rear wall;

(2) a pair of tubular arms fixed to each of the top and bottom of the post, extending normal thereto and parallel to the plane of said wall;

(3) arm extension means removably and telescopically mounted on the free end of each arm;

(4) further arm means removably and telescopically mounted on an intermediate section of each said tubular arm, extending outwardly therefrom and normal to a vertical plane;

(5) means for locking the parts in said telescoped disposition;

(6) an arcuate support band extending outwardly from the end of each of said arm extension means and further arm means;

(7) each said support band being operatively in vertical alignment with a second of said support bands;

(8) a horizontally disposed plate extending outwardly from the bottom of each lower support band whereby a golf bag may be supported thereon; and

(9) strap means associated with each upper arcuate support band whereby a said supported golf bag may be retained within an associated pair of vertically aligned support bands.

4,533,014

Patent Not Issued For This Number

4,533,015

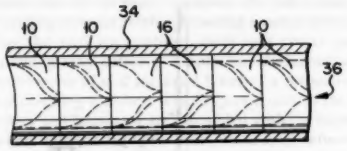
SOUND ARRESTING DEVICE

Hisao Kojima, 3-53-21, Shioiri-cho, Tsurumi-ku, Yokohama-shi, Japan

Filed Feb. 23, 1984, Ser. No. 582,714
Claims priority, application Japan, Feb. 28, 1983, 58-32040
Int. Cl.³ F01N *1/10, 1/12*
U.S. Cl. 181—280 **21 Claims**

1. A sound arresting device comprising a plurality of longitudinally coupled elements, each of the elements including a cylinder having an axis extending in a longitudinal direction and coupled to an adjacent cylinder of another element spaced therefrom along said longitudinal direction, and a blade formed in said cylinder so as to be integral therewith, each said blade being helically twisted along said longitudinal direction

of said cylinder and being arranged such that each end of each said blade crosses an adjacent end of an adjacent blade, so that



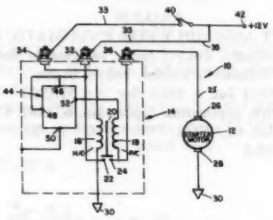
an inner portion of said cylinder is divided into plurality of channels through each of which a gas flows.

4,533,016

ANTITHEFT IGNITION SYSTEM AND SOLENOID APPARATUS FOR USE THEREWITH

Arnold L. Betton, Reseda, Calif., assignor to Phantom Systems, Inc., Van Nuys, Calif.

Filed Oct. 14, 1983, Ser. No. 541,866
Int. Cl.³ B60R *25/00*
U.S. Cl. 180—287 **19 Claims**



13. In a solenoid apparatus for use in a motor vehicle having a power source, an ignition switch, and a starter motor, the combination comprising:

a solenoid housing;

a spool within said housing having wound thereon first and second coils;

circuit means within said housing, said circuit means having controllable semiconductor means and control means;

first terminal means on said solenoid housing for connection to the power course of said vehicle, second terminal means on said solenoid housing for connection to the starter motor of said vehicle and third terminal means on said solenoid housing for connection to the ignition switch of said vehicle;

plunger means at least partially insertable within said spool for axial movement in response to electrical energization of both said first and second coils;

contact means actuated by actuation of said plunger means for electrically interconnecting said first and second terminal means to complete a circuit from the power source of the vehicle to the starter motor thereof;

means within said housing for connecting said control means of said circuit means to said third terminal means;

means within said housing for connecting said first coil between said third terminal means and ground;

means within said housing for connecting the input of said circuit means to said third terminal means for sensing closures of said ignition switch, said control means being responsive to a predetermined sequence of closures for enabling said controllable semiconductor means; and

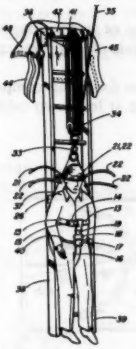
means for connecting said controllable semiconductor means to one end of said second coil, the other end of said second coil being connected to said third terminal means for deenergizing said second coil in response to actuation of said plunger.

4,533,017

SAFETY DEVICE AND HARNESS FOR USE IN SAME

Peter A. Litchfield, 335 A 37th St., SW., Calgary, Alberta, Canada T3C 1R5

Filed Feb. 3, 1984, Ser. No. 576,723
Claims priority, application Canada, Sep. 27, 1983, 437695
Int. Cl.³ A61F *5/04*; A62B *37/00*
U.S. Cl. 182—3 **13 Claims**



1. A rescue device of the type adapted to be applied to to the body of an injured person for lifting or lowering the injured person, said rescue device comprising, in combination:

(a) a body backing base section made of a foldable, flexible sheet material and including a normally upper end section provided with a fastening device for securing the base section to a rope or the like, said base section including a head portion disposed at a close spacing from said fastening device, a central portion spaced from said head portion a distance corresponding to the distance between the head and the level of the part of the human chest disposed slightly below the level of armpits of an average grown-up human body, and a lower portion disposed normally below said central portion;

(b) first strap means secured to said head portion for holding the head of an injured person in contact with said head portion;

(c) transverse second strap means connected with said central portion for wrapping around the chest of an injured person, thereby to hold the body of the injured person to the base section;

(d) a band **(16)** secured at one end to, and extending downwardly coextensively with the longitudinal certerline of, said base section lower portion; and

(e) buckle means for releasably fastening the other end of said band with said second strap means, said buckle means including a first part **(17)** secured to said other end of said band, and a complementary second part **(18)** secured to said second strap means.

4,533,018

LADDER SUPPORT

Sammie J. Tyson, 1501 NW. Ave. "F", Belle Glade, Fla. 33430

Filed Jul. 7, 1983, Ser. No. 511,483
Int. Cl.³ E06C *7/16*
U.S. Cl. 182—121 **2 Claims**

1. A platform adapted for use with a ladder, said ladder being in a plane and comprising rungs disposed in said plane, wherein:

said platform comprises a means for fixing said platform means to said ladder; and a generally planer elongate support means, the plane of said support means extending transverse to said plane of said ladder, said support means having first and second ends distally opposite along the

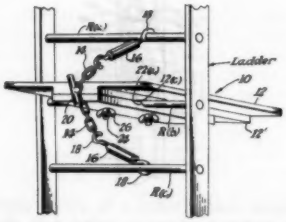
elongate length of said support means, said support means comprising a through hole means substantially mediate of said first and second ends, said through hole means adapted to surround a

preselected rung of said ladder;

wherein said through hole means is selected so that said support means is free to rotate about said preselected rung absent said means for fixing, each of said first and second ends threby rotating about said preselected rung and through hole;

whereby said plane of said support means substantially extends on either side of said plane comprising said rungs of said ladder;

wherein said means for fixing comprises at least two cable means, each said at least two cable means extending be-



tween and fixed to one of said ends of said platform means and a rung of said ladder, respective ones of said at least two cable means being fixed to rungs of said ladder other than of said preselected rung;

wherein one or more of said at least two cable means comprises a turnbuckle means for adjusting the length of said at least two cable means;

wherein said support means comprises first and second elongate members joined along their elongate lengths and coincident with the elongate length of said support means as a whole, each of said first and second elongate members comprising a depression transverse to said elongate length of said support means, said first and second elongate members joined so that said depressions mate to form said through hole in said support means.

4,533,019

MAXI-BALL LUBRICATOR AND DISPENSER FOR MUZZLE LOADING FIREARMS

Kenneth J. Leding, Ozark, Ark., assignor to Leding Loader, Inc., Ozark, Ark.

Filed Apr. 27, 1984, Ser. No. 604,527
Int. Cl.³ F42B *31/02*; F41C *27/00*
U.S. Cl. 184—14 **5 Claims**

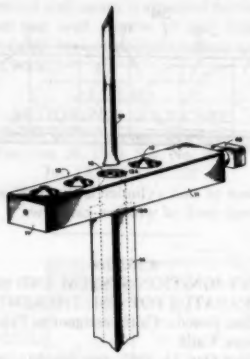
1. A portable maxi ball lubricator and dispenser for loading muzzle loading firearms, said dispenser comprising:

an elongated frame adapted to be hand-held by a shooter, said frame having a longitudinal axis;

a plurality of generally cylindrical bullet chambers defined in said frame adapted to at least temporarily store a bullet for subsequent loading into a muzzle loading firearm, each of said chambers being spaced-apart at regular intervals along the length of said frame and substantially centered thereupon in perpendicular relationship with respect to said longitudinal axis;

a grease reservoir defined in said frame for storing lubricating grease; and,

passageway means for delivering grease from said reservoir to said chambers to substantially uniformly lubricate said bullets disposed therewithin, said passageway means including a first tunnel interconnecting a first one of said chambers to said grease reservoir, a plurality of subsequent tunnels interconnecting adjacent subsequent chambers, and a terminal relief vent establishing fluid flow



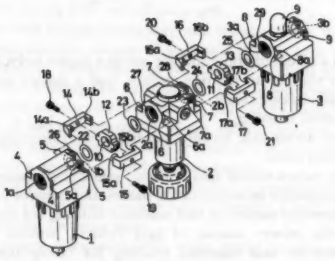
communication between the last one of said chambers and external atmosphere.

4,533,020

THREE-UNIT ASSEMBLY FOR PNEUMATIC CIRCUIT

Masamichi Yamazaki, Tokyo, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 510,193
Claims priority, application Japan, Jul. 6, 1982, 57-101273
Int. Cl.³ F16L *15/00*; F16N *21/00*
U.S. Cl. 184—55.2 **4 Claims**



1. A three-unit assembly for a pneumatic circuit, comprising:

a filter including an inlet port and an outlet port;

a regulator including an inlet port and an outlet port;

a lubricator including an inlet port and an outlet port;

each of said filter, regulator and lubricator including a portion for defining an air passage between said inlet port and said outlet port thereof, respectively, each air passage defining portion including a pair of projections extending oppositely from each other adjacent its respective inlet and outlet ports, all of said projections being V-shaped and substantially the same size;

coupling members provided between adjacent ones of the filter, regulator and lubricator, each said coupling member defining an air passage for alignment between the outlet port of one of the filter, regulator and lubricator and the inlet port of the next adjacent one of the filter, regulator and lubricator, each said coupling member further including a pair of threaded bores extending generally transversly of the axis of its said air passage, the threaded bores opening generally in opposite directions;

striding members for engaging the projections of adjacent ones of the filter, regulator and lubricator, each said strid-

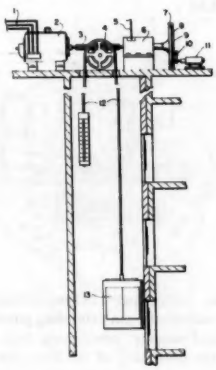
ing member including a pair of leg portions, each said leg portion having a V-shaped region complementarily configured to the V-shaped regions of the projections and adjacent ones of the filter, regulator and lubricator, each said striding member further including a center portion for joining the two leg portions, each said center portion including means defining a hole for alignment with a respective one of said threaded bores of a respective one of said coupling members when adjacent ones of the filter, regulator and lubricator are assembled with the respective coupling member between them, an O-ring between the respective coupling members and the adjacent ones of the filter, regulator and lubricator, and said striding members being positioned on at least two sides of the assembly with the V-shaped regions of the striding members engaging respective V-shaped regions of the projections on the adjacent ones of the filter, regulator and lubricator and bolts capturing the respective striding member center portions and engaging with a respective one of said threaded bores in the coupling members, the V-shaped regions of each one of said striding members being inclined away from each other so that the adjacent ones of the filter, regulator and lubricator are pulled together to compress the O-rings and seal the air passages as the bolts are tightened.

4,533,021

LIFT EXIT EMERGENCY SAFETY SYSTEM

Marcelino Perez de la Orden, Calle Sancho, Ramirez No. 15, Pamplona, Spain

Filed Nov. 15, 1983, Ser. No. 551,930
Claims priority, application Spain, Nov. 15, 1982, 517.396
Int. Cl.³ B66B *5/02*
U.S. Cl. 187—29 R **5 Claims**



1. A safety device for the emergency evacuation of a cabin at a safe floor in an elevator shaft, comprising:

a main motor having an electrical input and a mechanical output;

a three-phase current cable means, electrically connected to the main motor, for supplying electrical energy to the main motor;

a conveyor means, mechanically connected to the main motor, for lifting and lowering the cabin in the elevator shaft;

an electric brake having an electrical input side and a mechanical output end and being connected at the output end to the conveyor means;

an inertia flywheel being connected at the input side of the electric brake and having an outer periphery;

wheel means, positioned around the outer periphery of the inertia flywheel, for driving and stopping the inertia flywheel;

gripper frame means, positioned around the outer periphery of the inertia flywheel, for pushing the wheel means against the outer periphery of the inertia flywheel;

electromagnetic means, connected to the gripper frame means, for actuating the gripper frame means; and

an auxiliary motor means, connected to the wheel means, for supplying mechanical energy to the wheel means;

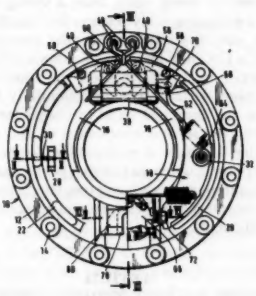
whereby the inertia flywheel rotates when actuated in an emergency so that the conveyor means lifts/lowers the cabin in the elevator shaft to the safe floor for evacuation.

4,533,022

HYDRAULICALLY OPERABLE BRAKE, IN PARTICULAR, A SERVO BRAKE

Wilhelm Schneider, Mannheim, Fed. Rep. of Germany, assignor to Deutsche Perrot-Bremse GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 12, 1983, Ser. No. 541,073
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1982, 3239455
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—18 R **9 Claims**



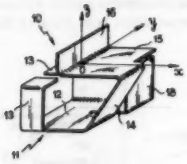
1. Hydraulically operable internal shoe-drum brake for vehicles, especially stacking vehicles, in which the axles of the driven wheels are connected each with a corresponding axle gear which is provided with a cover (**10**) arranged secure against turning on the vehicle, said axle gear cover forming a brake carrier and having a circumferential zone, said brake comprising a wheel cylinder (**38**) fastened to the circumferential zone of axle gear cover (**10**), which wheel cylinder (**38**) is connected by hydraulic lines (**48**) with a pressure medium source, an automatic readjusting device (**66**) fastened to the circumferential zone (**12**) of the axle gear cover (**10**) lying opposite to the wheel cylinder (**38**), two brake jaws (**18**), the oppositely lying ends of which abut on the piston of the wheel cylinder and on the readjusting device (**66**), a brake-jaw bracing angle piece (**16**) fastened to the axle gear cover and supporting said brake jaws, and restoring springs (**62**) which engage on the brake jaws and on the axle gear cover (**10**).

4,533,023

ELASTIC AND SLIDING LOCKING DEVICE FOR DISC BRAKE WITH A FLOATING CALIPER SUPPORTED BY A SINGLE AXIAL PIN, AND DISC BRAKE EQUIPPED WITH SUCH A DEVICE

Jean-Jacques Carré, Le Raincy; Pierre Courbot, Villiers le Bel, and Jean-Claude Méry, Pavillons Sous Bois, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Jun. 13, 1983, Ser. No. 503,990
Claims priority, application France, Jun. 28, 1982, 82 11273
Int. Cl.[3] F16D *55/224*
U.S. Cl. 188—73.34 18 Claims



1. An elastic and sliding locking device for a disc brake of the type comprising a floating caliper slidingly mounted on a fixed support by means of a single axially extending pin, the locking device being arranged between one lateral end of the caliper opposite said pin and an adjacent part of the fixed support by being fixedly mounted on a first component of a pair of components consisting of said caliper end and said adjacent part of the fixed support so as to cooperate in guiding the sliding of said two components relative to one another by means of an engagement portion of the device in sliding contact engagement with adjacent slide zones of the respective components in the normal operating position of said brake, at least said engagement portion of said locking device being capable of being retracted elastically so as to allow the caliper to pivot about the pin adjacent said normal operating position, the locking device being made from a spring steel sheet and comprising a mounting body portion for fixedly mounting the device onto said first component, the engagement portion consisting of a flat slide leaf surface connected to said mounting body portion by an intermediate leaf zone forming a flexible inclined ramp surface extending angularly away from said body portion and arranged so as to cooperate in contact engagement with the second component of said pair of components in order to cause a momentary displacement of said engagement portion when said caliper is pivoted to said normal operating position and said engagement portion resiliently returning to be interposed between said adjacent slide zones of the two components.

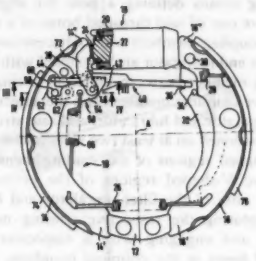
4,533,024

AUTOMATIC ADJUSTING DEVICE FOR A BRAKE

Heinrich B. Rath, Vallendar, Fed. Rep. of Germany, assignor to Lucas Industries, Birmingham, England

Filed May 24, 1982, Ser. No. 381,555
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121985; May 18, 1982, 3218788
Int. Cl.[3] F16D *65/56, 65/52*
U.S. Cl. 188—79.5 B 6 Claims

1. An automatic adjusting device for a brake, in particular a motor vehicle brake, in which a strut (40) whose effective length depends on the relative positions of two strut portions (44, 46) adjustable with respect to each other is connected in parallel with a brake actuating mechanism (18), one of said strut portions being subjected to the force of a biasing adjustment member acting transversely of the longitudinal direction of the strut (40) and, upon actuating of the brake, tending to increase the length of the strut (40), the adjustment member cooperating with an intermediate member (24) which is disposed between and frictionally engaged by two structural members (14", 22) transmitting the actuating force (P) independently of the strut (40) and which is displaceable against the frictional resistance (Q) of said two structural members provided said resistance does not surpass a given value, the strut (40) comprising two strut portions (44, 46) which are threadedly engaged and one of which is fixed against rotation while



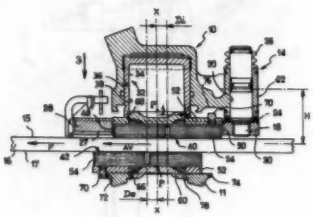
the other one is supported rotatably and provided with ratchet teeth (48) engaged by an adjustment member embodied by a pawl (50) having a pivot axis and loaded by an adjustment spring (66), characterized in that the intermediate member (24) is pivoted at the pawl (50) at a distance from said pivot axis.

4,533,025

DISC BRAKE WITH A SLIDING CALIPER

Jean-Jacques Carré , Le Raincy, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 445,131, Nov. 29, 1982, abandoned.
This application Jan. 17, 1985, Ser. No. 692,328
Claims priority, application France, Nov. 30, 1981, 81 22345
Int. Cl.[3] F16D *65/14*
U.S. Cl. 188—73.44 5 Claims



1. A disc brake, comprising a caliper mounted to slide on a fixed support by means of a pin extending parallel to the axis of the disc, said fixed support comprising two arms extending radially toward the periphery of the disc, the two arms comprising a front arm and a rear arm in accordance with the forward direction of rotation of the disc relative to the fixed support, a brake motor including a piston mounted to slide in a bore of the caliper and acting directly on an inner friction element and, as a result of reaction via the caliper, on an outer friction element, the friction elements each including a support plate to which a friction lining is fixed, upon actuation of the brake motor said inner friction element bearing on a bearing surface formed on said front arm and thereby retarding rotation in the forward direction of rotation of the disc, said outer friction element fixed to the sliding caliper to which is transmitted friction forces generated when the outer friction element engages frictionally the rotating disc and the friction forces communicated to said pin and rear arm, the friction forces from the friction elements being distributed substantially equally to the front and rear arms of the fixed support, and differential wear correction means comprising the center of the friction lining of the inner friction element being offset tangen-

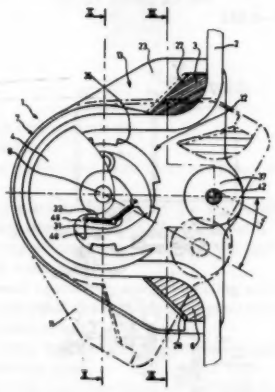
tially in the direction of said rear arm relative to a radial plane passing through the axis of said piston, and the center of the friction lining of the outer friction element being offset tangentially in the direction of the front arm relative to said radial plane, the centers of the friction linings being offset equal distances from said radial plane in order to prevent differential wear of said linings, said inner friction element and outer friction element being identical and each support plate provided with positioning means interacting with corresponding means formed on the brake to assure correct positioning of said friction elements, the positioning means comprising a central portion of the respective support plate projecting from the plane of the plate, the central portion of the outer friction element being received in an aperture of corresponding shape disposed in the caliper and the central portion of the inner friction element being received in a recess in the piston of the brake motor, the positioning means further including correcting means comprising a cylindrical stud fixed to the support plate and extending perpendicularly to the plate, the stud of said outer friction element being received in a corresponding hole in the caliper, and the stud of said inner friction element being received in a clearance disposed in the caliper.

4,533,026

DEVICE WHICH CAN BRAKE AND/OR STOP A LOAD SECURED TO IT AND WHICH FALLS, NOTABLY AN ANTI-FALL SAFETY DEVICE

Georges C. Bernard, Uriage, France, assignor to G.A.M.E.S., Uriage, France

Filed Oct. 7, 1982, Ser. No. 433,300
Claims priority, application France, Oct. 7, 1981, 81 18908
Int. Cl.³ B65H *59/16*
U.S. Cl. 188—184 **11 Claims**



1. A device which is movable along a preferably taut rope and is connectible to a load, said device being operable when the load falls to brake and/or stop the falling movement of the load comprising:

a casing having two opposite cheeks,

a shaft wxtending through the casing and supported by said cheeks,

a pulley supported on the shaft and located in the casing between said cheeks,

a pawl means operable in response to centrifugal force of pulley rotation to lock the pulley against rotation relative to the casing in at least one direction,

a first diverter mounted solely on one of said cheeks and a second diverter mounted solely on the other of said cheeks of the casing, each diverter extending from its respective cheek toward the other cheek, said diverters being disposed so that a rope which is diverted by one of said diverters passes about a portion of the circumference of said pulley and is diverted by the other diverter,

at least one of said cheeks being movable on said shaft between a closed position of the casing in which the cheeks are axially adjacent and an open position of the casing in which the cheeks are spaced apart along said shaft,

said cheeks comprising means which are operable to be engaged with each other to limit the relative rotational movement of the cheeks about the axis of said shaft when the diverters tend to move away from each other in response to tension of the rope, and also are operable to limit the relative translational movement of the cheeks along the axis of said shaft, said engageable means being operable when said cheeks are in the closed position,

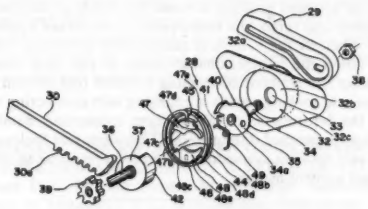
said device being constructed so that a rope can be introduced in the casing between its cheeks and disposed on said pulley and said diverters at any point of its length when said casing is in said open position, and said cheeks are maintained together by said engageable means in response to tension of the rope when said casing is in said closed position.

4,533,027

FRICTION BRAKE ASSEMBLY

Toshiaki Otani; Takeshi Chihara, and Tsutomu Nishikori, all of Hiroshima, Japan, assignors to Mazda Motor Corporation and Delta Kogyo Co., Ltd., both of Hiroshima, Japan

Filed Jul. 28, 1983, Ser. No. 518,012
Claims priority, application Japan, Aug. 9, 1982, 57-138827; Aug. 9, 1982, 57-121184[U]
Int. Cl.³ F16D *67/02;* **B60T** *13/04*
U.S. Cl. 192—8 C **8 Claims**

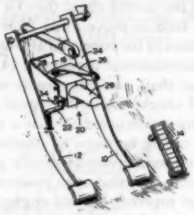


1. A friction brake assembly which comprises a brake drum accomodating therein an operating member mounted on a drive shaft for rotation together therewith, a hanger member mounted on a driven shaft for rotation together therewith, a coiled braking spring adapted to contact an inner peripheral surface of the brake drum to apply a braking force to stop the transmission of motion between the drive and driven shafts, and a pair of guide members interposed between the operating member and the hanger member and loosely pivotally connected to opposite ends of the braking spring, respectively, each of said guide members having a first abutment normally engageable with the hanger member, when and so long as the operating member is not rotated, to stop the motion of the hanger member, and a cam area engageable with the operating member during the rotation of the operating member, the normal engagement between the respective guide member and the hanger member being released by the pivotal movement of the respective guide member which takes place as a result of engagement between the cam area and the operating member at an initial stage of rotation of the operating member, a clearance necessary to release the braking spring, thereby permitting the operating member and the hanger member to rotate relative to each other, being formed between one of the operating member and the guide member and the hanger member subsequent to the disengagement between the respective guide member and the hanger member.

4,533,028
MECHANICAL BRAKE CONTROL DEVICE

Alistair G. Taig, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Feb. 18, 1983, Ser. No. 467,701
Int. Cl.³ B60K 41/24
U.S. Cl. 192—13 A 25 Claims

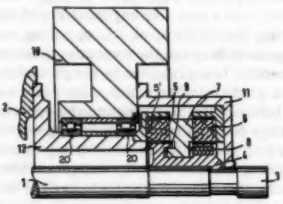


1. An improved mechanical brake control device for a vehicle including a brake pedal and a clutch pedal wherein the brake is movable to a brake applied position during braking and the clutch pedal is movable to an actuated position to control operation of a transmission or the like for the vehicle, the device comprising a housing associated with the vehicle, a connecting member coupled to the brake pedal and movable therewith relative to the housing, locking means carried by the housing and cooperating with the connecting member, control means coupled to the clutch pedal and cooperating with the locking means to alter the cooperation of the latter with the connecting member in response to the position of the clutch pedal, the locking means being engageable with the connecting member when the vehicle is on an incline and the clutch pedal is in its actuated position to resist movement of the connecting member and retain the brake pedal in the brake applied position whereby the vehicle is substantially prevented from rolling down the incline, characterized in that said connecting member is a resilient connecting member that deform slightly when said locking means is engaging said connecting member and the deformation of said resilient connecting member providing for gradual disengagement between said locking means and said resilient connecting member in response to operation of said control means.

4,533,029
CLUTCH AND BRAKE DEVICE FOR PRESSES, PUNCHES, AND THE LIKE

Heinz Weber, Wäschenbeuren, Fed. Rep. of Germany, assignor to L. Schuler GmbH, Fed. Rep. of Germany

Division of Ser. No. 503,085, Jun. 15, 1983, which is a continuation of Ser. No. 247,739, Mar. 26, 1981. This application Oct. 11, 1983, Ser. No. 540,355
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011589
Int. Cl.³ B60K 41/24
U.S. Cl. 192—18 A 10 Claims



1. A clutch and brake arrangement for a press or punch having a flywheel means, and a drive shaft means having an end projecting beyond a support frame of the punch or press, the arrangement including

a friction clutch means for selectively connecting the drive shaft means to the flywheel means,

a friction brake means for selectively braking the drive shaft means,

a hollow support means projecting beyond the support frame and extending through the flywheel means and surrounding the drive shaft means is provided for supporting the friction brake means,

an annular support means extends over the friction brake means and is attached to the flywheel means for enabling an engagement of the flywheel means with the drive shaft means by the friction clutch means,

a bearing means is provided for supporting the flywheel means on the hollow support means, and the bearing means is arranged between the support frame on the one hand and the friction clutch means and friction brake means on the other hand, wherein

the hollow support means includes a hollow support sleeve and a tubular extension attached to the support frame,

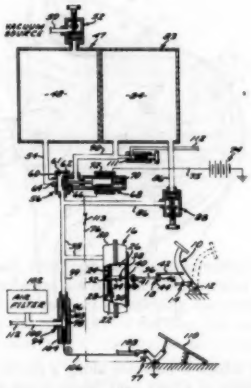
the bearing means includes a pivot bearing means and a bearing sleeve surrounding the hollow support sleeve, the latter being mounted to the flywheel on a side thereof facing the support frame, and

the tubular extension surrounds the hollow support sleeve and the bearing means.

4,533,030
CLUTCH ACTUATING SYSTEM

Albert L. Gabriel, 13853 Charlan Rd., Valley Center, Calif. 92082

Filed Jan. 22, 1982, Ser. No. 341,801
Int. Cl.³ B60K 41/28
U.S. Cl. 192—0.052 41 Claims



1. A method for actuating a normally engaged clutch of a manual transmission type vehicle, which comprises:

applying a first pressure level that is different than atmospheric pressure to a pressure differential operated clutch servo to cause said servo to disengage said clutch;

establishing a second pressure level in clutch re-engagement control chamber means;

substantially simultaneously cutting off said application of said first pressure level to said servo and placing said control chamber means and its second pressure level in communication with said servo so as to allow partial release of said first pressure level into said control chamber means and thereby effect a first stage of clutch re-engagement; and

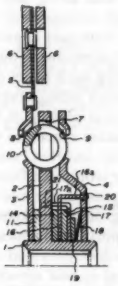
venting said servo to atmospheric pressure so as to allow complete release of said first pressure level from said servo and thereby allow said clutch to become fully re-engaged.

4,533,031

CLUTCH DISK HAVING ALTERNATINGLY CONNECTED SUBPLATES BETWEEN FRICTION WASHERS

Tamio Nagano, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jun. 29, 1982, Ser. No. 393,401
Claims priority, application Japan, Jun. 30, 1981, 56-98241[U]
Int. Cl.³ F16D *3/14, 3/66, 13/64*
U.S. Cl. 192—106.2 **5 Claims**



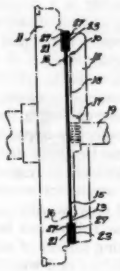
1. A clutch disk comprising:
a clutch plate,
cushioning plates fixed to an outer periphery of said clutch plate,
a retaining plate spaced apart from said clutch plate and connected thereto so as to rotate therewith,
a hub having a flange interposed between said clutch plate and said retaining plate,
spring means operatively interconnecting said flange with said clutch plate and said retaining plate for relative rotation therebetween,
a first friction washer interposed between said flange and said retaining plate,
a first subplate interposed between said first friction washer and said retaining plate,
a second friction washer interposed between said first subplate and said retaining plate,
a second subplate interposed between said second friction washer and said retaining plate,
a sliding member interposed between said second subplate and said retaining plate,
a cone spring interposed between said sliding member and said retaining plate biassing said sliding meber, said second subplate, said second friction washer, said first subplate and said first friction washer towards said flange,
means for connecting said first subplate to said retaining plate for rotation therewith,
means for connecting said second subplate to said flange for rotation therewith, and
a third friction washer interposed between said flange and said clutch plate.

4,533,032

FRICTION ENGAGING DRIVES WITH CERAMIC MATERIALS

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 22, 1982, Ser. No. 443,839
Int. Cl.³ F16D *11/00*
U.S. Cl. 192—107 M **10 Claims**



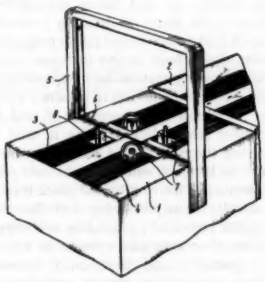
1. A clutch driven plate comprising an annular clutch plate operatively connected to a clutch hub on a transmission input shaft, a plurality of annular temperature and/or coefficient of friction sensitive friction buttons formed from a ceramic, cera-metallic or sintered metal powder, and means to rotatably mount the buttons on the annular plate adjacent its periphery to smooth the harsh feel of clutch engagement of the buttons with a flywheel and pressure plate, said rotatable mounting means comprising a plurality of openings in said clutch plate, an axle received in each opening, each friction button having a central opening therein receiving an end of the axle, the opposite ends of the axle being headed to retain the friction buttons on the clutch plate, and reduced diameter bearing means between each friction button and the clutch plate.

4,533,033

MECHANISM FOR ROTATING AN OBJECT OVER A DETERMINED ANGLE ABOUT A VERTICAL AXIS

Wilhelmus F. S. M. van Wegen, Maartensdijk, Netherlands, assignor to Metaverpa B.V., Maartensdijk, Netherlands

Filed Dec. 27, 1982, Ser. No. 452,926
Claims priority, application Netherlands, Dec. 30, 1981, 8105908
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—413 **6 Claims**



1. In a strapping machine which includes a strapping mechanism and a conveyor system for rectilinearly moving objects to and away from said strapping mechanism, the strapping mechanism being operative in a vertical plane which is perpendicular to said rectilinear direction of movement of said objects, the

improvement wherein said conveyor system includes a working surface and four openings extending therethrough, two of said four openings being located on one side of said vertical plane and the remaining two of said four openings being located on the opposite side of said vertical plane; and wherein an object-turning mechanism is operatively positioned below the working surface of said conveyor system, said object-turning mechanism including a support frame, four rollers mounted on said support frame, said four rollers being positioned to be simultaneously positionable in a respective one of said four openings in the working surface of said conveyor system, each roller being rotatable about a horizontal axis and oriented so as to be tangent to the circumference of a common circle, two endless belts for rotating said four rollers in the same direction with respect to the circumference of said common circle, a first of said two endless belts driving a first pair of said rollers which are located on respective opposite sides of said vertical plane and a second of said two belts driving the second pair of said rollers which are located on respective opposite sides of said vertical plane, and means for moving said support frame vertically upwardly and downwardly such that at least a portion of each of said four rollers can be located in an active position above the working surface of said conveyor system or in an inactive position below said working surface.

4,533,034

METHOD AND APPARATUS FOR AUTOMATICALLY SUPPLYING AND REMOVING PALLETS OF A PALLET MAGAZINE TO AND FROM THE WORKING SPACE OF A MACHINE TOOL

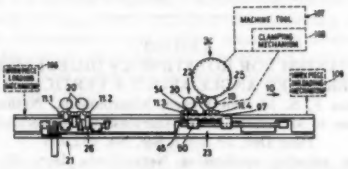
Hans Gregg, Woerthsee, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen-und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Aug. 11, 1982, Ser. No. 407,182

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1981, 3133588

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—472 **11 Claims**



1. A method of automatically moving pallets which can each carry a workpiece between a support member and a pallet magazine which has endless chain means, a plurality of said pallets resting loosely on and being moved by said chain means, comprising the steps of: loading a workpiece to be machined on each said pallet of said pallet magazine as it passes a loading station, said chain means then carrying the loaded pallets from said loading station to a separating mechanism; causing said separating mechanism to produce a predetermined spacing in the direction of movement of said chain means between successive said pallets passing it, said chain means thereafter carrying the pallets to a pick-up station; utilizing a slide mechanism to lift each said pallet at said pick-up station off said chain means and move it to and place it on said support member, and simultaneously utilizing said slide mechanism to pick up a said pallet previously placed on said support member and to place it back on said chain means at a location therealong which is spaced in said direction of movement of said chain means from said pick-up station, said chain means then carrying such pallet to an unloading station; causing a clamping mechanism of a machine tool to pick up the workpiece supported by said pallet on said support member; causing said machine tool to perform a machining operation on the workpiece held by said clamping mechanism; causing said clamping mechanism to return the workpiece to said pallet on said support member before such pallet is moved from said support member by said slide mechanism; removing the machined workpieces from said pallets on said chain means as said pallets pass said unloading station, and thereafter moving the unloaded pallets from a location on said chain means downstream of said unloading station to a location on said chain means upstream of said loading station.

2. An apparatus for automatically carrying workpieces to and from a machine tool, comprising: elongate conveyor means supported for lengthwise movement in a generally horizontal direction of movement; a plurality of pallets removably supported on said conveyor means for movement therewith, each said pallet being adapted to support a workpiece; loading means provided at a location along said conveyor means for loading a workpiece to be machined onto each said pallet passing thereby; separating means provided at a location along said conveyor means spaced in said direction of movement from said loading means for imparting a predetermined spacing in said direction of movement between successive said pallets passing thereby on said conveyor means; a support arrangement provided at a location along said conveyor means spaced in said direction of movement from said separating means and adapted to support one of said pallets thereon; a slide mechanism provided along said conveyor means in the region of said support arrangement and having means for lifting one said pallet from said conveyor means at a pick-up location spaced in said direction of movement from said separating means and placing such pallet on said support arrangement while simultaneously lifting a further said pallet from said support arrangement and placing it back on said conveyor means at a return location spaced in said direction of movement from said pick-up location, said machine tool having means for clamping the workpiece from each said pallet placed on said support arrangement, for machining such workpiece, and for then releasing such workpiece before the pallet is moved from said support arrangement by said slide mechanism; and unloading means provided at a location along said conveyor means spaced in said direction of movement from said return location for removing the workpiece from each said pallet passing thereby on said conveyor means.

4,533,035

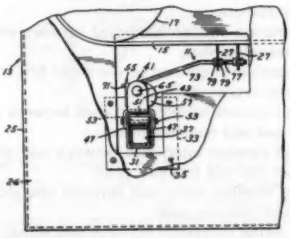
CONVEYOR BELT CLEANER

Robert C. Reiter, Darby, Mont., assignor to Material Control, Inc., Croswell, Mich.

Filed Jan. 4, 1984, Ser. No. 567,989

Int. Cl.³ B65G *45/00*

U.S. Cl. 198—499 **15 Claims**



1. A conveyor belt cleaner for use on a conveyor having an endless belt comprising;

an elongated support member having a first longitudinal axis adapted to extend transversely of the endless belt;

a blade support assembly mounted upon and overlying said support member and having a second longitudinal axis spaced from and parallel to said first axis;

said blade support assembly including a spring support of

U-shape having a first base overlying said support member and secured thereto;

a spring cradle of U-shape having a second base at a generally right angle to said first base and a pair of spaced apertured support arms nested within said spring support;

a pivot bolt assembly mounted upon and extending through said spring support and spring cradle along said second axis;

said blade support assembly also including a blade adapted to scrape the endless belt;

a spring arm at one end secured to said blade and extending towards said spring cradle;

and a helical spring within said spring cradle mounted upon said pivot bolt assembly and having one end anchored to said cradle and having its other end extending laterally of said second axis and connected to said spring arm;

said spring cradle being adapted for angular adjustment relative to said spring support about said second axis to adjust said spring arm and to thereby position said blade in operative engagement with the endless belt.

4,533,036

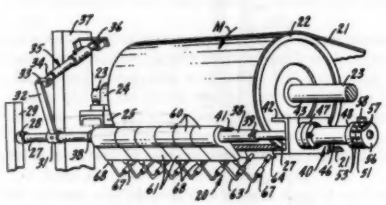
CONVEYOR BELT SCRAPER

James R. Gordon, 301 W. Boling, Benton, Ill. 62812

Filed Oct. 14, 1983, Ser. No. 541,800

Int. Cl.³ B65G *45/00*

U.S. Cl. 198—499 **16 Claims**



1. A conveyor belt scraper comprising:

a shaft extending transversely of a conveyor belt in spaced relation to the surface of the belt to be scraped;

a plurality of molded, resilient elastomer blade supports mounted on the shaft in a longitudinal array extending across the belt, each blade support secured to the shaft for rotation therewith and each blade support including an integral flexurally resilient elastomer balde mount arm projecting outwardly from the blade support;

a plurality of scraper blades mounted on the blade mounts of the blade supports, each blade extending into engagement with the surface of the belt; and

torsion bias means, connected to the shaft, resiliently torsionally urging the shaft toward rotation in an angular direction such as to bias the scraper blades into continuing firm engagement with the conveyor belt surface, the torsion bias means comprising:

a torsion tube of elastomer material encompassing a portion of the shaft and having one end affixed to a fixed frame member;

first and second rigid collars, each affixed to one end of the torsion tube, the first collar being affixed to the fixed frame member;

and adjustable link means for connecting the second collar to the shaft to maintain the second collar and the shaft in any one of a plurality of different angular orientations relative to each other to thereby adjust the effective bias force on the shaft.

4,533,037

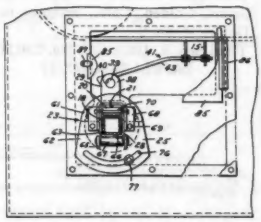
TELESCOPING CONVEYOR BELT CLEANER

James F. Kerr, Croswell, Mich., assignor to Material Control, Inc., Croswell, Mich.

Continuation of Ser. No. 473,474, Mar. 9, 1983, abandoned. This application Oct. 11, 1984, Ser. No. 659,911

Int. Cl.³ B65G *45/00*

U.S. Cl. 198—499 **21 Claims**



16. A conveyor belt cleaner for a conveyor having an endless belt with upper and lower runs, having an elongate support member adapted to be secured near the lower run, and extending transversely across the lower run, first and second end supports interconnecting said support member to opposite sides of the conveyor, a blade carrying member moveably attached to the elongate support member and having means for attaching a blade thereto, said blade being a substantially rigid member adapted to engage the surface of the lower run of the endless belt to scrape debris therefrom in an operative position wherein the improvement comprises:

a plurality of rotatable members disposed between the elongate support member and said blade carrying member to facilitate moving said blade carrying member along the elongate support member, said blade carrying member substantially enclosing the rotatable members and the elongate support member when in its operative position to shield the same from debris falling downwardly from the lower run of the endless belt.

4,533,038

CONVEYOR FOR OBJECTS TREATED WHILE CONTINUOUSLY IN MOTION

Jacques R. Richard, Cachan, France, assignor to Manufacture de Machines du Haut-Rhin, Mulhouse, France

Continuation-in-part of Ser. No. 917,575, Jun. 21, 1978. This application Jul. 19, 1982, Ser. No. 399,801

Claims priority, application France, Jun. 22, 1977, 77 19197

Int. Cl.³ B65G *17/26*

U.S. Cl. 198—646 **8 Claims**

1. An endless chain conveyor adapted to transport objects in an installation for treating them while they are in continuous motion, the conveyor being made up of a plurality of simlar open-topped carriers which carry objects to be treated from one station of the installation to another, the conveyor further comprising means for connecting each pair of consecutive carriers with at least a degree of freedom of tipping of one carrier with respect to another in a direction angularly about the direction of travel of the chain conveyer, conveyer drive means for cooperating with an external drive means, means for turning the chain conveyor gradually about a first axis which extends in the direction of travel of the chain conveyor to invert the chain conveyor including its carriers, said means for

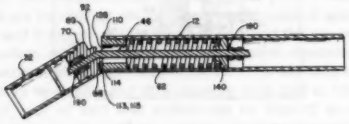
connecting each pair of consecutive carriers, and said conveyor drive means from their upright positions at a first location, and means for thereafter turning the entire chain conveyor gradually about a second axis parallel to the first axis to return the chain conveyor and the carriers to their upright positions.

4,533,039

DEFLECTABLE PIN ASSEMBLY

Conrad M. Grims, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Sep. 9, 1983, Ser. No. 530,506
Int. Cl.³ B65G *47/84*
U.S. Cl. 198—651 **12 Claims**



2. A deflectable pin assembly mountable on a conveyor chain for use in transporting open ended containers comprising:

a. first elongate sleeve means having a forward end and a rear end for supporting an open ended container thereon;

b. second elongate sleeve means having a forward end and a rear end for mounting said deflectable pin assembly on a conveyor chain;

c. connection means for seating and pivotally connecting said first elongate sleeve means and said second elongate sleeve means;

d. biasing means for biasing said first sleeve means in a predetermined position relative said second sleeve means; wherein said biasing means comprises spring means mounted within one of said first sleeve means and said second sleeve means;

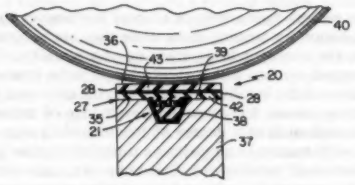
e. said pin assembly having a biased position wherein said first sleeve mens is positioned in substantially coaxial relationship with said second sleeve means, and said pin assembly having a plurality of deflected positions wherein said first sleeve means is positioned in obtuse angular relationship relative said second sleeve means.

4,533,040

BELT CONSTRUCTION AND METHOD OF MAKING THE SAME

Anderson W. Howerton, Christian County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 530,568, Sep. 9, 1983, which is a continuation-in-part of Ser. No. 315,840, Oct. 28, 1981, abandoned. This application Jun. 18, 1984, Ser. No. 621,967
The portion of the term of this patent subsequent to Sep. 11, 2001, has been disclaimed.
Int. Cl.³ B65G *15/34*
U.S. Cl. 198—847 **12 Claims**



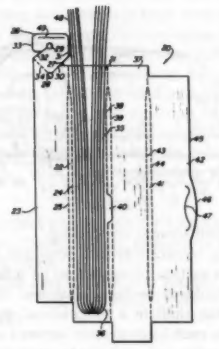
1. In a belt construction comprising a tension section having opposed sides and a top surface, a compression section, a load-carrying section intermediate said tension section and said compression section, a fabric covering means covering the exterior of said sections, and a load supporting top section secured to said top surface of said tension section and extending beyond said opposed sides of said tension section, the improvement wherein said fabric covering means is substantially U-shaped in cross section and has the free ends of the legs thereof extending beyond said top surface of said tension section in respective directions substantially the same as said opposed sides of said tension section and being fully embedded in said top section to tend to prevent said free ends from being delaminated form said belt construction.

4,533,041

MULTISTRAND SUTURE PACKAGE WITH SINGLE STRAND SUTURE DISPENSING

Jorge L. Aday, Lambertville, and Robert J. Cerwin, Pittstown, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 31, 1984, Ser. No. 636,424
Int. Cl.³ A61L *17/02*
U.S. Cl. 206—63.3 **14 Claims**



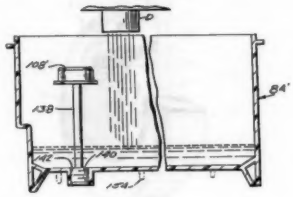
1. An elongated rectangular suture folder and retainer for a plurality of sutures which allows for single strand dispensing of the sutures said folder and retainer comprising; a first suture winding panel having an elongated rectangular shape, a second suture holding panel having an elongated rectangular shape and foldably connected to said first panel along a longer longitudinal edge thereof, one of said first or second panels having an extension extending beyond a shorter edge of said other panel, a first opening in the panel having said extension said opening being disposed within said panel and substantially adjacent said extension, the second opening being disposed in said extension, said openings being aligned with respect to each other at an angle of 45° or less as measured from a longitudinal extending line through the panel and extension, a first slit extending from an edge of the extension to the first opening, a second slit extending from an edge of the extension to the second opening, a third cover panel foldably connected to the free longitudinal edge of said first suture winding panel and a fourth locking panel foldably connected to the free longitudinal edge of said third cover panel.

4,533,042

MOTOR OIL CHANGE KIT AND CATCH PAN FOR USE IN CHANGING AUTOMOTIVE MOTOR OIL

William F. Pollacco, 3819 Burlingame Pl., Alexandria, Va. 22309

Continuation of Ser. No. 297,082, Aug. 27, 1981, Pat. No. 4,403,692. This application Jul. 29, 1983, Ser. No. 501,625
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.[3] B65B *39/00*; B65D *81/36*; F16N *31/00*
U.S. Cl. 206—223 15 Claims



1. A do-it-yourselfer's oil catch pan, for use with a jug of new oil sufficient to fill or at least substantially fill the engine oil reservoir of a pre-selected motor vehicle to its proper level, in an instance where the jug has an opening provided with an openable and closable closure cap,

said oil catch pan, comprising:

a self-supporting container sized and configured to be slid on the ground to a position under a motor vehicle crankcase and having a bottom wall and a peripheral sidewall with a top opening for receiving used oil drained from the crankcase;

said bottom wall of said container having means providing at least one seating surface thereon, each such seating surface being cooperable with said jug for enabling the oil catch pan to be seated on the jug in overlying relation thereto when the jug is upright, uncapped and has been emptied of new oil;

said bottom wall of said container having means defining an oil drain aperture formed therethrough;

said bottom wall sloping downwards toward said oil drain aperture;

at least one said seating surface being located distally of said oil drain aperture and being constructed and arranged to be supported upon a corresponding top portion of the jug distally of said opening of said jug;

a closure member for said oil drain aperture, said closure member being selectively and removably positionable in obstructing relation to said oil drain aperture to block flow of used oil through said oil drain aperture;

said oil drain aperture being constructed and arranged to register with said opening in the jug when the oil catch pan is seated on the jug in overlying relation thereto with the jug in an upright, uncapped, emptied of new oil disposition, for enabling used oil which has been drained into the oil catch pan from the preselected motor vehicle through said top opening to be transferred from the oil catch pan to the jug upon manipulation of said closure member to unblock said oil drain aperture, thereby making it unnecessary to pour the used oil out of the oil catch pan through said top opening by tilting or tipping the oil catch pan, so that the used oil may be drained from the oil catch pan into the jug and the jug re-capped for transporting the used oil to a disposal site without spillage;

said removing member being a gripping member which is constructed and arranged to extend to a level which lies above the level of the used oil in the oil catch pan; and

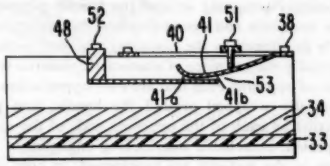
said gripping member comprising a cap constructed and arranged to openably and reclosably cap the jug, and a rod securing that cap to said closure member.

4,533,043

INTEGRATED CIRCUIT PACKAGE MAGAZINE AND RECEPTACLE

Thomas L. Swain, Barrington, R.I., assignor to Monolithic Memories, Inc., Sunnyvale, Calif.

Filed Apr. 5, 1983, Ser. No. 482,121
Int. Cl.[3] B65D *73/02*
U.S. Cl. 206—328 17 Claims



1. A magazine for multiple semiconductor packages comprising an elongated tube having an interior cross-sectional configuration adapted to confine in sliding orientation particularly shaped semiconductor packages:

means on at least one end of said tube for partially closing said end and preventing egress of packages confined in said tube,

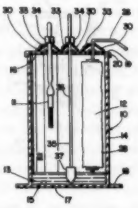
said means comprising a spring gate attached to said tube and extending inwardly from a wall surface of said tube to intersect in its normal neutral position a front end of a semiconductor package, said package facing said at least one tube end and slidable in said tube and wherein said spring gate is attached to said wall surface adjacent an end of said tube and extends angularly into said tube and in a direction away from said tube end, said spring gate being deflectable toward said tube wall surface out of intersection with said package front end to allow egress of a package from said tube.

4,533,044

STORAGE CONTAINER FOR PAINT APPLICATORS

Thomas E. Ban, 1156 Berwick La., South Euclid, Ohio 44121

Filed Jul. 19, 1984, Ser. No. 632,382
Int. Cl.[3] A45D *44/18*; B65D *81/24*
U.S. Cl. 206—362 10 Claims



1. A device for holding a paint applicator, such as a paint brush or paint roller, which has a handle for holding, comprising:

(a) a container for holding liquid, such as paint thinner, the container having a closed bottom and sides which define a liquid holding chamber, the container having an open top in vertical spaced relation above the bottom, when the container is vertically disposed;

(b) a cover sealing the open top of the container, the cover having at least one small opening from which a number of slits, cut through the cover, extend in radial directions to form therebetween, a plurality of pie-shaped segments which are flexible and deflectable upwardly and downwardly out of the plane of the cover, the opening and surrounding flexible segments designed to receive the

handle of the paint applicator, the handle extending through the opening exteriorly of the container and held therein such that the vertically lowermost portion of the applicator is maintained in spaced relation above the bottom of the container;

(c) means for detachably mounting the cover on the open top of the container; and

(d) a reusable, flexible steel, separate from the cover, for conically wrapping around the handle protruding from the container and opening, when the applicator is properly positioned in the container, the seal including (i) a specially shaped piece of elastomeric material which has a pair of opposing ends that are overlapped when the seal is conically wrapped around the handle, and (ii) means carried by each of the opposing ends of the material for repeated, detachable interlocking engagement when the ends of the material are overlapped, to hold the seal in tightly wrapped relation around the handle, the seal designed to rest in supported relation on the cover and to compressively engage the handle and cover the opening and radially oriented slits to seal the chamber from the ambient atmosphere and hold the handle to prevent it from slipping into the chamber of the container, the conical wrapping of the seal designed to form a sturdy support with, in effect, a variable size opening in which differently sized handles can be compressively engaged and supported.

4,533,045

TOOTHBRUSH HOLDER AND PRESERVER

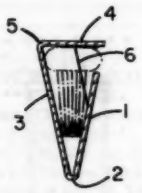
Patrick G. Stein, 1153 Bowness Rd. NW., Calgary, Alberta, Canada T2N 3J6

Filed Nov. 15, 1984, Ser. No. 671,499

Claims priority, application Canada, Apr. 11, 1984, 451758

Int. Cl.³ B65D *83/10*

U.S. Cl. 206—362.3 **14 Claims**



1. A holder for a toothbrush including:

(i) a first substantially rectangular side wall;

(ii) a second substantially rectangular side wall sharing a first common longitudinal edge with the first side wall and angulated thereto, said second side wall being wider than said first side wall; and

(iii) a third substantially rectangular side wall sharing a second common longitudinal edge with said second side wall, and extending substantially normal thereto;

said first and second side walls defining therebetween a wedge-shaped chamber adapted to receive the bristles of said toothbrush and to bias the sides of said bristles inwardly whilst said third side wall defines retaining means for retaining said toothbrush in said holder, said bristles upon insertion into said holder thereby forming a wedge-shaped mass whereby they retain their natural operative direction without deformation during drying thereof.

4,533,046

WOUND BODY OR PACKAGE

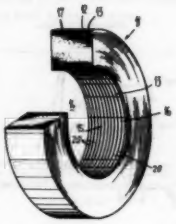
Volker Kuhnert, Kerkrade, Netherlands, and Franklin Niedrig, Berikon, Switzerland, assignors to Strapex AG, Wohlen, Switzerland

Filed Jun. 25, 1984, Ser. No. 624,147

Claims priority, application Switzerland, Jul. 19, 1983, 3939/83

Int. Cl.³ B65D *85/67.5, 85/67, 71/02*

U.S. Cl. 206—389 **14 Claims**



1. In a wound package composed of a wound-up band and a support body for supporting the wound-up band and possessing a continuous axial opening, the improvement which comprises:

forming the support body essentially from the wound-up band; and

the band being wound onto the wound package such that the latter contains a plurality of essentially parallel windings formed of the wound-up band.

4,533,047

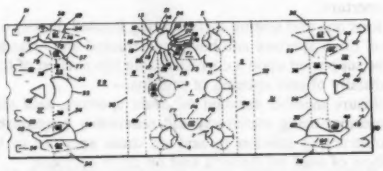
HEEL RETAINING STRUCTURE ON BOTTLE CARRIER

Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Aug. 1, 1984, Ser. No. 636,579

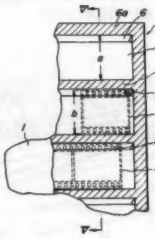
Int. Cl.³ B65D *71/00*

U.S. Cl. 206—434 **8 Claims**



1. A bottle carrier of the wrap around type having top, bottom and side walls interconnected to form a tubular open ended structure wherein a sloping heel panel is interconnected with each side wall along a fold line and with an associated bottom lap panel along a fold line and wherein bottle heel receiving apertures are formed in each sloping heel panel which extend into the associated side wall and lap panel and wherein the improvement comprises combination bottle engaging and carrier reinforcing flaps foldably joined respectively along the outer edges of the bottle heel receiving apertures which are disposed immediately adjacent the open ends of the carrier, each bottle engaging and carrier reinforcing flap extending across the associated sloping heel panel and into the associated side wall and lap panel and having a fold line formed therein one end of which coincides with the fold line between the associated sloping heel panel and the associated lap panel and which is angularly disposed to said fold line and which is disposed in a plane which is substantially parallel with the inner surface of the associated lap panel.

4,533,048
FILM JACKET
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Continuation of Ser. No. 311,021, Oct. 13, 1981, abandoned.
This application Aug. 22, 1983, Ser. No. 525,268
Claims priority, application Japan, Nov. 6, 1978, 53-136593
Int. Cl.³ B65D *85/48*
U.S. Cl. 206—455 **15 Claims**



1. A film jacket for receiving and holding a film having a length dimension and a width dimension, the film having a central image bearing portion positioned between marginal side portions, said film jacket comprising a base sheet; at least one surface sheet made of a transparent plastic sheet and having three side edges thereof fixed to said base sheet while keeping one side edge thereof left open for forming a pocket between the base sheet and the surface sheet, said pocket having a first dimension larger than one of the dimensions of the film received in the pocket and a second dimension smaller than the other dimension of the film so that a portion of the received film extends outside of the pocket, said first and second dimensions being such that all of the central image bearing portion of the film is received within said pocket; and at least one cover member fixed at only one edge to said base sheet along said open edge of said surface sheet so that said cover member covers at least a portion of the film received in said pocket which extends outside the pocket, the portion of said cover member fixed to the base sheet and the portion of said surface sheet fixed to said base sheet being parallel to said open edge and the spacing between the fixed portions being slightly wider than the other dimension of the film received into said pocket, said at least one cover member having only one edge fixed to said base sheet, other said edges thereof being separated from said base sheet so that the other side edges of said at least one cover member are movable away from said sheet to facilitate insertion of film into said pocket.

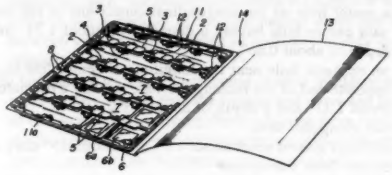
4,533,049
SLIDE FILE SHEET
Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan
Filed Mar. 6, 1984, Ser. No. 586,731
Claims priority, application Japan, Apr. 9, 1983, 58-61548
Int. Cl.³ B65D *85/48, 1/36*
U.S. Cl. 206—455 **13 Claims**

1. A slide file sheet comprising:

a film holding plate having a plurality of rectangular recesses aligned with each other in rows and columns,

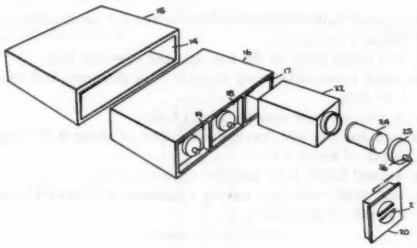
frame supports for retaining frames of slide film in said respective rectangular recesses,

separating means for preventing said slide films from directly contacting respective bottoms of said rectangular recesses of the plate, and



a flexible cover being at least partially transparent and attached at its one side edge to one side edge of said film holding plate.

4,533,050
CUSHIONED CONTAINER
Louis S. Bake, Jr., 4625 24th Rd. North, Arlington, Va. 22207
Filed Feb. 10, 1984, Ser. No. 579,166
Int. Cl.³ A45C *11/20*
U.S. Cl. 206—545 **14 Claims**



1. A cushioned container capable of simultaneous use as a seat cushion and a receptacle for containing consumable materials comprising, an inner enclosure having an outer cushion layer bounding at least a portion of said inner enclosure, first container disposed in said inner enclosure having a plurality of compartments of first respective predetermined cross-sectional shapes, a corresponding plurality of second containers individually having first chambers for receiving temperature controlling materials, and individually having second chambers for receiving consumable materials, said second containers being adapted for disposition in the respective compartments of said first container, said second containers having second respective predetermined cross-sections of complementary shape and size with respect to said first respective cross-sectional shapes such that the combination of respective said second containers disposed in said first container furnish predetermined support for said outer cushion layer to permit use of said cushioned container as a seat cushion.

4,533,051
BOTTLE HOLDER
Ray D. Fleming, 803 Arrah, Friona, Tex. 79035
Filed May 4, 1984, Ser. No. 607,233
Int. Cl.³ B65D *1/36, 6/04*
U.S. Cl. 206—563 **4 Claims**

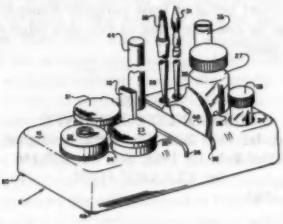
1. A holder for material comprising:

a. a rectangular base having a length of about 7" and a width of about 3.8" and a height of about 1.5",

b. a planer top,

c. a handle at about the center of gravity of the base which is about the middle of the planer top,

d. said handle projecting up from the planer top about 2" above the planer top,
e. two holes near the handle, each of about 1.5" in diameter and about 1" deep,
f. a center hole on the longitudinal center line of the base,
g. said center hole having a diameter of about 1.33" and a depth of about 0.66",
h. an opposite hole near the longitudinal center line on the opposite end of the rectangular base, having a diameter of about 1.33" and a depth of about 1.1",
i. two elongated slots,
j. said slots spaced apart about 0.8", and about 0.5" deep and extend from side to side.



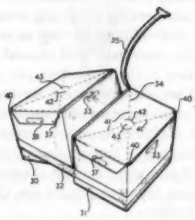
k. a dowel hole between the slots about 0.5" in diameter and about 1" in depth,
l. two brush holes in the top near the opposite hole,
m. each brush hole being about 0.2" in diameter and about 1.1" deep,
n. a dropper hole near the brush holes,
o. said dropper hole having a diameter of about 0.33" and a depth of about 1.1",
p. a small bottle hole near the opposite hole,
q. said small bottle hole having a diameter of about 0.75" and a depth of about 0.9".

4,533,052

DUAL CARTON

Melvin C. Fruchey, and Michael J. Kubicki, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 27, 1984, Ser. No. 583,556
Int. Cl.³ B65D *5/34*
U.S. Cl. 206—602 **4 Claims**



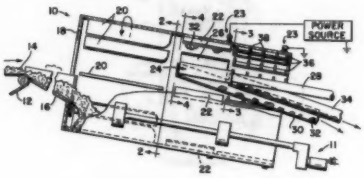
1. A multiple article package comprising, a first open-topped, four-sided carton with fully closed bottom, for holding a first array of articles, a second open-topped, four-sided carton for holding a second array of articles, said cartons being in abutting relationship, means adjacent the top of at least all of the non-abutting sides of both cartons for providing dual handgrips for each carton, easily severable means holding said open-topped cartons together with the abutting sides deining a vertical plane, a generally rectangular cap covering both open-topped cartons and attached thereto and wherein said cap is formed with means extending across the portion thereof overlying the abutment plane of said cartons for easy separation of the cap when separation of the package into two cartons is affected.

4,533,053

ROTARY DRUM MAGNETIC SEPARATOR

Garry R. Kenny, College Grove; Edward J. Sommer, Jr., and Charles E. Roos, both of Nashville, all of Tenn., assignors to Magnetic Separation Systems, Inc., Nashville, Tenn.

Continuation-in-part of Ser. No. 457,675, Jan. 13, 1983. This application May 25, 1983, Ser. No. 498,129
Int. Cl.³ B03C *1/02*
U.S. Cl. 209—636 **15 Claims**



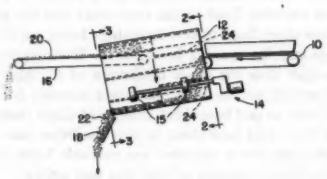
1. Material treating apparatus adapted to be rotated around a cylindrical axis comprising a cylinder open at least in part at both ends thereof and having spaced around the inside of the circumferential wall thereof a plurality of elongated magnetic flights extending toward the central axis of said cylinder, each running longitudinally along a substantial part of the length of said cylinder.

4,533,054

ROTARY FUEL HOMOGENIZER AND USE THEREOF

Edward J. Sommer, Jr., Nashville; Garry R. Kenny, College Grove, and Charles E. Roos, Nashville, all of Tenn., assignors to Magnetic Separation Systems, Inc., Nashville, Tenn.

Filed Jan. 13, 1983, Ser. No. 457,675
Int. Cl.³ B07B *13/05*
U.S. Cl. 209—687 **5 Claims**



1. A municipal waste treating apparatus comprising a single cylinder having an inner annular wall, adapted to be rotated around the axis of said single cylinder, said single cylinder being of substantially the same diameter along its entire length and open at least in part at both ends thereof; said cylinder having spaced around the inside of said annular wall thereof a first set of substantially straight extensions extending from an inner surface of said wall toward said axis of said cylinder and running parallel to said axis only a first half of the length of said cylinder, said substantially straight extensions having rodlike extensions at an angle at their inner ends, said rodlike extensions being knife blade-like to facilitate breaking open and emptying plastic bags, said cylinder having a second set of similarly positioned but much shorter extensions extending from said inner surface to said annular wall and running along only a second half of the length of said cylinder, said cylinder having discharge means and being substantially hollow and substantially unimpeded along said length thereof except for said extensions and except for said discharge means, and said

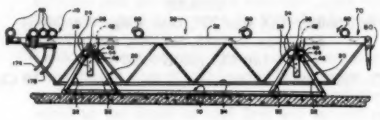
annular wall being substantially continuous except for said extensions and without perforations.

4,533,055

STORAGE RACK FOR DRILLING TUBULARS

Keith M. Haney, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed Jun. 2, 1982, Ser. No. 384,405
Int. Cl.[3] A47F 7/00
U.S. Cl. 211—70.4 11 Claims



1. A rack for drilling tubulars, said rack comprising:

a base having two spaced support pedestals mounted thereon;

a support member having two spaced attachment members mounted thereon;

first and second columns;

means for mounting each of the first and second columns between a respective one of the support pedestals and a respective one of the attachment members to interconnect the base with the support member;

said base, support member, columns and mounting means configured to support a plurality of drilling tubulars extending transverse to the support member; and

means, included in the mounting means, for independently adjusting the positions of the first and second columns to independently control the tilt and the elevation of the support member with respect to the base such that either end of the support member can be elevated above the other end of the support member in order to cause drilling tubulars supported on the support member to roll to either selected end of the support member;

each of the pedestals comprising a plate having an opening passing therethrough, each of the columns being threaded and passing through the opening in a respective one of the plates, and the mounting means comprising a pair of nuts, each threadedly engaged to a respective one of the columns and positioned adjacent to and over the respective plate such that downward forces are passed via the columns, the nuts, and the plates to the pedestals.

4,533,056

SHELF AND BRACKET THEREFOR

George Krikorian, 39 Camp St., Paxton, Mass. 01612

Filed Feb. 13, 1984, Ser. No. 579,506
Int. Cl.[3] A47F 5/00
U.S. Cl. 211—153 2 Claims

1. A wire shelf and bracket therefor comprising

an open wire frame including a rear longitudinal wire and several mutually spaced longitudinal wires of like diameter, crosswires fixed and connecting the rear and several wires,

the bracket comprising a rigid elongated member, projections on an edge thereof, said projections being adapted to extend from one side of the wires to the other, each projection including a curved edge forming a bight, a pair of bights facing each other, and being apart a distance to springily receive two of the wires, and a third bight facing oppositely and springily receiving a third wire, said bights fixing the shelf to the bracket, the bracket being positioned under the shelf, the projections rising through the shelf,

a series of wires parallel to the first named wires and lying between certain pairs thereof in mutually evenly spaced relation,

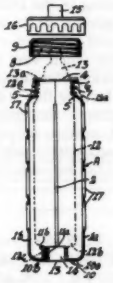
the last named series of wires being smaller in diameter and more closely spaced than the first named wires and certain of the series of wires being fixedly spaced from certain of the first named wires to a degree to just allow the entry of certain projections therebetween to provide for snapping the first named wires to the projections and to act to aid in preventing accidental dislodgement of the brackets, both series of wires being in fixed relation to each other.

4,533,057

FEEDING BOTTLE WITH TUBULAR HOUSING FOR CLAMPING FLEXIBLE CONTAINER

Klaus Klittich, P.O. Box 501, Germiston 1400, South Africa

Filed Mar. 17, 1982, Ser. No. 359,088
Claims priority, application South Africa, Mar. 31, 1981, 81/2145; May 4, 1981, 81/2939
Int. Cl.[3] A61J 9/00
U.S. Cl. 215—11 E 8 Claims



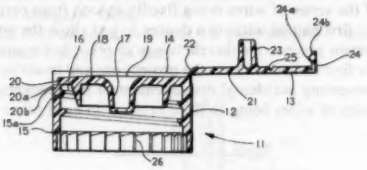
1. A feeding bottle housing of tubular configuration with an open upper end adapted to receive a teat and which is adapted to accommodate an open-ended flexible container in the interior of the housing with a mouth zone of the container folded over the upper end of the housing, the housing comprising two longitudinally divided sections which are linked together along a longitudinally extending hinge zone and are movable about the hinge zone between open and closed positions and clamping means located on a lower portion of the housing to anchor the base of a flexible container and fix the extent of the mouth zone of the container available for folding over the upper end of the housing, the clamping means comprising cooperating and elongated tongue and groove formations integral with the two housing sections, the formations presenting clamping surfaces of complementary curved cross-sectional configuration which are movable relative to each other in a direction transverse to the formations and about the longitudinally extending hinge zone between a separated, inoperative position when the two housing sections are in an open position and an operative position in which they mate to engage between them a base portion of the container when the two housing sections are in a closed position, the tongue formation also defining at least part of a socket adapted releasably to receive a projecting spigot formation on a removable teat cap.

4,533,058

ONE-PIECE THERMOPLASTIC CHILD-RESISTENT DISPENSING CLOSURE

Albert P. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 28, 1984, Ser. No. 676,029
Int. Cl.[3] B65D *55/02*
U.S. Cl. 215—216 **14 Claims**



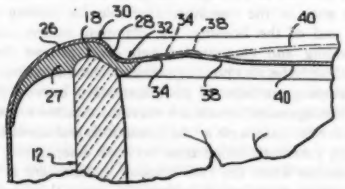
1. In a one-piece dispensing closure for a container with a closure receiving finish, which closure comprises; a body portion with a top panel and dispensing opening means in said top panel, an annular skirt depending from said top panel and adapted to surround the finish portion of said container, means extending inwardly from the annular skirt for engaging said finish to secure the closure to the container, and a locking flap hingedly connected to said body portion and comprising sealing means for sealingly engaging the dispensing opening means when the locking flap is in a closed position, said locking flap being foldable between said closed position and an open position to permit the dispensing of the contents of the container through the dispensing opening means when said locking flap is in said open position, said top panel containing a recess for receiving the locking flap when said locking flap is in the closed position, the improvement in which said recess is deeper than the thickness of the locking flap at the end of the locking flap away from the location of the hinged attachment of the locking flap to the body portion to permit said end of the locking flap to be depressed within said recess to expose said end for access to facilitate the movement of the locking flap to the opened position.

4,533,059

VACUUM-TAMPER INDICATING BUTTON FOR SMALLER DIAMETER CAPS AND THE LIKE

William J. Kapolas, Mt. Prospect; Peter A. Vercillo, Hinsdale; Daniel Dowling; George S. Beatovic, both of Chicago; Oscar N. Clifton, Schaumburg; Ronald Gatz, Park Ridge; Eugene W. Harford, Chicago; Chester Wilczenski, Lombard; John Dobbs, Des Plaines; Ronald Kowalczyk, Chicago; Derek G. Owen, Bensenville, and John N. Banich, Chicago, all of Ill., assignors to Continental White Cap, Inc., Northbrook, Ill.

Filed Jun. 13, 1984, Ser. No. 620,304
Int. Cl.[3] G01L *19/12*
U.S. Cl. 215—230 **17 Claims**



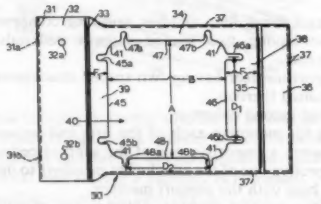
1. A closure cap for vacuum packed containers, said closure cap being in the form of a sheet metal shell configurated to include an outer skirt having at an upper edge thereof a downwardly opening channel for receiving a sealant, and an end panel recessed within said channel, said end panel being primarily in the form of a vacuum actuated tamper indicating button, said button including a radially outer upwardly sloping annular flange having a rise, an intermediate downwardly sloping annular flange having a dip and joined to said outer flange by a first radius, and an upwardly sloping central portion joined to said intermediate flange by a second radius, said central panel being movable downwardly under influence of a vacuum on said end panel to have a downward slope.

4,533,060

MOUNTING BRACKET FOR ELECTRICAL OUTLET BOXES

Lewis B. Medlin, P.O. Box 237, Blue Ridge, Va. 24064

Filed Jan. 9, 1985, Ser. No. 690,057
Int. Cl.[3] H02G *3/08*
U.S. Cl. 220—3.9 **19 Claims**



1. An electrical outlet box mounting assembly, comprising:

(a) a square outlet box having integrally joined base and sidewalls formed with a selected number and size of knock-out discs and on the outer edge of each sidewall of one opposed pair of said sidewalls having a pair of inwardly-directed, laterally-spaced screw receiving tabs with threaded holes and overlying an interior chamber formed by said box with the pair of tabs on one said sidewall opposing and being laterally spaced apart the same distance as the pair of tabs on the opposite said sidewall;

(b) a dry wall ring having a central opening and a peripheral plate flange with screw clearance openings arranged for being mated to said tab threaded holes;

(c) an L-shaped unitary mounting bracket formed of a single piece of stiff sheet material, including:

(i) first and second rectangular plate portions in right angular relation adapted for securement adjacent respective side and front surfaces of a construction stud; and

(ii) a plate body portion extending outwardly from said second plate portion having:

(aa) at an outer end a third rectangular flat plate end portion in the same plane as the plane of said second plate portion;

(bb) between said third plate portion and second plate portion having a fourth rectangular plate portion in a plane offset from and substantially parallel to the plane of said second and third plate portions by an amount substantially equal to the thickness of said dry wall ring flange, said fourth plate portion plane being established by parallel offsets formed on both sides of said fourth plate portion;

(cc) a substantially square opening in said fourth plate portion defined by opposed straight parallel upper and lower and opposed straight parallel right and left side edges formed in said fourth plate portion around said opening, said right and left edges being parallel to said offsets and said opening being sized to register with the interior chamber of said box with the width of said opening being substantially equal to the spacing between a tab on one of said sidewalls and the opposite tab on another of said sidewalls;

(dd) a first pair of laterally spaced screw slots extending from the said upper edge of said fourth plate portion opening, said slot lateral spacing being equal to the lateral spacing between the threaded holes in each of said pair of tabs;

(ee) a second pair of laterally spaced screw slots extending from the said lower edge of said fourth plate portion opening, said second pair of slots having a depth equal to the depth of said first pair of slots and sufficient for at least limited vertical box mounting adjustment on said bracket and being positioned opposite to said first pair of slots, said lateral spacing between said second pair of slots also being equal to the lateral spacing between the threaded holes in each of said pair of tabs;

(ff) a third pair of laterally spaced screw slots extending from the left edge of said fourth plate portion opening and having a lateral spacing and depth substantially equal to the depth of said first and second pair of slots;

(gg) a fourth pair of laterally spaced screw slots extending from the right edge of said fourth plate portion opening, said fourth pair of slots being positioned opposite to the position of said third pair of slots and having a lateral spacing equal thereto and a depth substantially twice the depth of said first, second and third pair of slots enabling horizontal box mounting adjustment on said bracket;

(hh) a flange ring turning surface established by the spacing of said right and left edges of said opening from the said respective offsets on either side thereof and formed such that when a selected screw clearance opening on said dry wall ring rotates around a screw installed in a selected one of said tab threaded holes as another diagonally opposite selected said screw clearance opening is positioned to engage another diagonally opposite screw in another diagonally opposite said tab threaded hole, the bottom surface of said dry wall ring is able to slide on said fourth plate portion;

(ii) between each pair of slots at the corners of said opening an outwardly curved edge serving as a continuation of the slot edge on either side thereof; and

(d) a plurality of screws adapted for being loosely fitted in said slots and for being secured in said tab threaded holes, whereby when an electric outlet box is positioned adjacent the inner side of said fourth plate portion in position with respect thereto so that the interior of said electric outlet box is accessible through said fourth plate portion opening and a dry wall ring is fixed to the outer side of said fourth plate portion, said slots enable said junction box, bracket and dry wall ring to be held in operative position with screws passed through said slots and secured in said tab-threaded holes independent of said tabs being oriented to mate with said right and left edges or alternatively with said upper and lower edges surrounding said opening and whereby the outer surface of the flange of said ring is maintained when said screws are tightened in substantially the same plane as the outer surface of said second and third plate portions.

4,533,061

FOOD TRAY AND LID WITH SEALED PANELS AND METHOD OF FORMING SAME

Walter B. Herbst, Evanston, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Sep. 17, 1979, Ser. No. 76,516

Int. Cl.³ B65D *6/32*; A45C *11/20*

U.S. Cl. 220—4 B **8 Claims**

1. A food serving tray or lid therefore which includes an insulator permanently encased between thermoplastic top and bottom panels wherein the improvement comprises: a peripheral ledge portion formed on one panel, said ledge having a generally horizontal section and retaining lip formed thereon extending in a generally vertical direction when the tray is in a horizontal position; a peripheral tongue portion formed on the other panel, said tongue having a laterally extending spacer portion fitting against the ledge portion inside lip to provide a lateral gap between said lip and tongue on the side of said

spacer portion opposite said ledge portion; and a bonding material between said lip and tongue portions providing a peripheral seam that is protected from fracture when the tray is laterally impacted about said lip during handling.

4,533,062

CONTAINER CLOSURE FOR SUPPLYING AIR TO OR REMOVING AIR FROM A CONTAINER

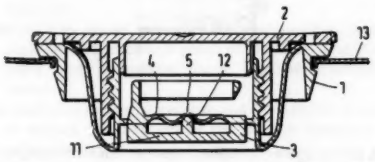
Günter Krautkrämer, Budenheim, Fed. Rep. of Germany, assignor to Jacob Berg KG, Bundenheim, Fed. Rep. of Germany

Filed Aug. 10, 1984, Ser. No. 640,031

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3328953

Int. Cl.³ B65D *51/22*

U.S. Cl. 220—258 **20 Claims**



1. A container closure made from plastics, for supplying air to or removing air from a container, comprising a closure lower portion which can be connected to the container and has a diaphragm portion which comprises one piece with said lower portion, closes the pouring opening and can be torn out, and a cap which can be detachably connected to the closure lower portion characterised in that the diaphragm portion has a resilient diaphragm with an opening which in the normal position of the diaphragm portion is sealed in an air-tight manner by a projection of the container closure abutting with the opening, wherein the diaphragm of the diaphragm portion is prestressed against the projection of the container closure, and a hollow space of the cap adjoining the opening is in open connection with the atmosphere.

4,533,063

CONTAINER LID HAVING AN OPENING DEVICE

Norbert Buchner, Winnenden; Rolf Eberspächer, Rommelshausen, and Dieter Liede, Möglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 21, 1983, Ser. No. 534,455

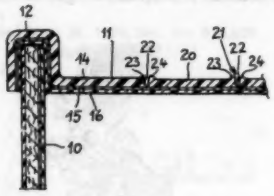
Claims priority, application Fed. Rep. of Germany, Sep. 23, 1982, 3235167

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **14 Claims**

1. A container lid having an opening device, said lid comprising at least an outer, thick carrier layer made of a thermoplastic synthetic material and an inner sealing layer capable of being welded to a container body, said carrier layer including

a weakened line indentation at least partially surrounding a tear-open portion, characterized in that the container lid is



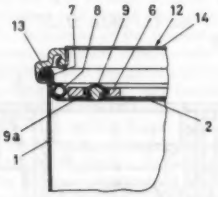
formed by a composite laminate material and that the weakened indentation line in the carrier layer of the composite material is embodied as a heat-impressed indentation.

4,533,064

CAN AND CLOSURE STRUCTURE

Kiyoshi Kawamata, and Seizi Kawamata, both of Ohomiya, Japan, assignors to Nihon Seikan Kabushiki Kaisha, Ohomiya, Japan

Filed Aug. 27, 1984, Ser. No. 644,675
Int. Cl.³ B65D *17/46*
U.S. Cl. 220—273 **4 Claims**



1. A can or similar container construction removably capped by a top cover having an intermediate film base partition detachably mounted over the open top of the can body, the partition carrying a peripheral score line and a straight score line across the partiton as well as a finger grip allowing the partition to be detached apart from the can body, comprising:

said finger grip having a mounting hole on one side acting as a pivotal or fulcrum point upon pulling the finger grip up from the other side thereof;

said intermediate film base partition having a hollow protrusion integrally formed thereon, for being inserted into said mounting hole; and

a reinforcing metal packing member backing said hollow protrusion from the inside thereof, whereby said finger grip is solidly secured to the partition by inserting the reinforced hollow partition into said mounting hole of the finger grip and subjecting said reinforced hollow protrusion to deformation for engaging the mounting hole of the finger grip.

4,533,065

CONTAINER HAVING ONE PIECE PERIPHERAL RIM, AT LEAST TWO CARDBOARD PARTS AND A SYNTHETIC MATERIAL LAYER

Guy A. Chazal, Sannois, and Jean A. Bodet, Versailles, both of France, assignors to Societe Parisienne D'Impression et de Cartonnage, Haute de Siene, France

Filed Oct. 2, 1981, Ser. No. 307,833
Claims priority, application France, Jul. 11, 1980, 80 23782
Int. Cl.³ B65D *5/32, 5/56, 5/48*
U.S. Cl. 220—462 **14 Claims**

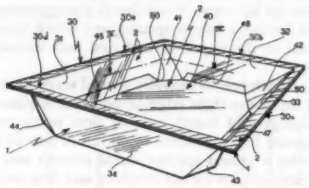
1. A container comprising:

an exterior cardboard portion and a portion of synthetic material;

said cardboard portion comprising distinct first and second cardboard pieces;

said first cardboard piece having a unitary rim with an upper side extending in a single plane and a plurality of first wall panels integral with the rim and being displaced below the said plane with adjacent edges of said displaced first wall panels being separated to form part of the complete side walls of the container;

said second cardboard piece having at least one bottom panel and a plurality of second wall panels integral with said bottom panel and displaced upwardly from said panel with edges of said displaced second wall panels being separated



from the edges of the other wall panels of the second piece to form a further part of the complete side walls of said container;

said portion of synthetic material being formed of a single layer adherently applied onto the bottom panel and onto a surface of the container side walls to form the interior of the container and onto the upper surface of the said rim; and

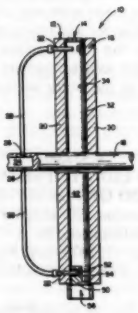
said complete side walls being formed by said first wall panels and said second wall panels being maintained in side-by-side interfitted juxtaposition by said single layer of synthetic material being adherently applied thereto with said first wall panels and said second wall panels being maintained in edge-to-edge juxtaposition, said second wall panels generally overlying the edges of said first wall panels.

4,533,066

SEED PLANTER, PLANTER ASSEMBLY AND METHOD OF PICKING UP AND DISCHARGING SINGLE SEEDS

Robert G. Holmes, and Scott A. Shearer, both of Columbus, Ohio, assignors to Ohio Agricultural Research & Development Center, Wooster, Ohio

Filed Sep. 29, 1982, Ser. No. 434,267
Int. Cl.³ B65G *15/02;* **B65H** *3/08*
U.S. Cl. 221—211 **20 Claims**



1. A seed planter comprising:

a seed transport member having a porous surface, said porous surface having an inner face adjacent to a seed loading station, said inner face supporting seeds in spaced

relationship to said transport member such that, when a seed is resting on said inner face of said porous surface and a jet of gas is directed at said seed normally and towards said porous surface, said inner face of said porous surface will allow air flow around the whole surface of said seed, including the side of said seed remote from said jet of gas;

a seed loading station;

a seed unloading station provided with seed removal means for removing a seed from said porous surface as said porous surface is moved past said seed unloading station;

gas jet means for directing a jet of gas substantially normally to the part of said porous surface lying adjacent said seed loading station as said part of said porous surface passes said seed loading station; and

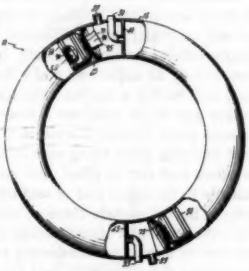
drive means for moving said porous surface past said seed loading station and thereafter past said seed unloading station.

4,533,067

FLUID MEDIUM STORAGE AND EXPULSION APPARATUS

Vincent J. Sansevero, Jr., East Hartford, and Walter F. Skrabal, Windsor Locks, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 9, 1982, Ser. No. 406,405
Int. Cl.³ F02K 9/50
U.S. Cl. 222—135 **10 Claims**



1. Apparatus for the storage therewithin and expulsion therefrom of a primary fluid, said apparatus comprising a generally tubular tank radially spaced from and disposed about a central axis normal to the longitudinal axis of the tank, a piston slidably disposed in said tank for longitudinal movement therewithin, thereby expelling said primary fluid from said tank, said tank including an inlet port through which a secondary fluid is introduced into said tank for driving said piston, said apparatus being characterized by:

a flexible, expandable shield connected at one end thereof to said piston and an opposite end thereof to an inner wall of said tank, said shield being expanded by movement of said piston, thereby forming a lining for said tank by which said tank is shielded from the effects of said secondary fluid;

said piston having a hollow portion interiorly thereof, said shield being foldably received within said hollow portion in a nonextended condition when said piston is disposed in a postion proximal to said inlet; and

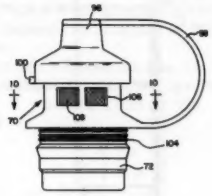
said hollow portion of said piston being provided with a tubular skirt extending therefrom interiorly of said shield for protecting said shield in a nonextended state from the initial effects of the admission of said secondary fluid into said tank.

4,533,068

STERILE SOLUTION DELIVERY AND VENTING DEVICES

Eugene J. Meierhoefer, Hackettstown, N.J., assignor to Health Care Concepts, Inc., Allamuchy, N.J.

Continuation-in-part of Ser. No. 293,519, Aug. 14, 1981, abandoned. This application Aug. 6, 1982, Ser. No. 404,484
Int. Cl.³ B65D 37/00
U.S. Cl. 222—189 **1 Claim**



1. A squeeze bottle for storing and dispensing multiple doses of a sterile liquid comprising:

a closed hollow body to contain said sterile liquid;

said body having a neck portion;

a normally closed deformable duck-bill valve mounted in said neck;

an air inlet port in said neck;

hydrophobic filter means mounted vertically behind said air inlet port;

captive cap means movable between an open dispensing position and a closed position covering said duck-bill valve and preventing finger touching contamination thereof;

co-operating means on said cap and the outside of said body to anchor said cap out of the flow of dispensed liquid when the cap is in open position;

said normally closed duck-bill valve operating, when the cap is on open position, in response to pressure created by squeezing said bottle to dispense sterile liquid and automatically closing on release of squeezing pressure;

said dispensing of sterile liquid creating a partial vacuum within said bottle;

said vacuum in cooperation with the structure of the squeeze bottle serving the dual purpose of causing sterile liquid remaining in the duck-bill valve and the space in the neck directly below the valve to be drawn back into the body of said bottle and providing a differential pressure between the vacuum within the bottle and the higher atmospheric pressure outside the bottle, whereby the external pressure compresses the deformable duck-bill valve down against said neck thus forcing any remaining sterile liquid back into the body of the bottle;

said hydrophobic filter means having a pore size which precludes passage of liquid and such that it sterilizes air passing into the bottle through the filter for equilibration of said vacuum;

said hydrophobic filter means and said air inlet port being spaced below said cap to permit said equilibration to take place even when the cap is in closed position;

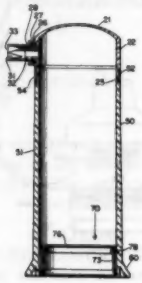
the vertical disposition of said hydrophobic filter preventing occlusion of said filter by external liquid when the squeeze bottle is in use position;

said cap when in closed position being tightly pressed against the external surface of the duck-bill valve thus preventing said valve from opening and discharging liquid no matter how the bottle is handled or squeezed when the cap is in closed position.

4,533,069
PUMP-TYPE DISPENSER

James L. Drobish, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1983, Ser. No. 546,343
Int. Cl.[3] B65D *37/00*
U.S. Cl. 222—209 7 Claims



1. A pump-type dispenser for a fluid product, comprising:

(a) a tubular container body having an axially extending bore for housing said fluid product, said container body having an upper end in direct communication with a discharge passageway and an open lower end;

(b) a check valve dispensing outlet located adjacent said discharge passageway, said outlet permitting said product to be dispensed outwardly therethrough at a desired rate of flow when product pressure within said dispenser attains a predetermined required dispensing pressure and sealing said passageway when the product pressure is reduced to atmospheric;

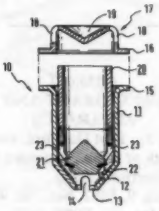
(c) finger activated pump means on said dispenser to raise the product pressure within said dispenser and displace a charge of product and, on release, to establish a vacuum within said dispenser which persists until volumetric equilibrium is established within said dispenser; and

(d) a follower piston slidably mounted within the bore of said tubular container body and sealing the same against escape of product from said lower end, said piston being formed of resilient material and comprising a face portion and a peripherally attached sidewall, said piston face being in constant direct fluid communication with said check valve dispensing outlet, said sidewall being formed with a peripheral contact band conforming to the shape of the cross section of the bore and dimensioned to provide an interference fit within the bore which exerts a predetermined normal force against the inner surfaces of said bore in static condition thereby establishing a predetermined frictional resistance to movement of said piston within said bore, said frictional resistance being substantially equivalent in both upward and downward directions of axial movement within said bore, being greater than the force applied to said piston by said required dispensing pressure and less than that applied to said piston by pressure imbalance caused by the establishment of said vacuum within said dispenser, and being the sole means for inhibiting retrograde movement of the follower piston whereby upon application of pump pressure to said product said predetermined frictional resistance prevents movement of said piston toward the open end of said bore while allowing said required dispensing pressure to be attained within said dispenser for dispensing said product, and upon reduction of product pressure to below atmospheric permits ambient air pressure to move said piston toward the upper end of said bore a distance corresponding to the volume of said displaced charge of product thereby establishing volumetric equilibrium within said dispenser.

4,533,070
VARIABLE VOLUME METERING VALVE FOR DISPENSING BEVERAGE CONCENTRATES

Anton Deininger, Bachhagel; Hartmann Nelzow, and Karlheinz Färber, both of Giengen, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeraete GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 299,640, Sep. 4, 1981,. This application Apr. 11, 1984, Ser. No. 599,266
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033873
Int. Cl.[3] B67D *3/00*
U.S. Cl. 222—439 1 Claim



1. Metering valve, comprising a substantially vertically-disposed, tubular housing, said housing having an upper and a lower end, said lower end of said housing having a valve seat formed thereon and an outlet opening formed in said valve seat, a substantially tubular ram being axially liftable in said housing, said ram having an upper end and a lower end, said lower end of said ram having a sealing cone formed thereon engaging said valve seat when said ram is lowered, and said ram having drainage ports formed therein in vicinity of said sealing zone, said draining ports being operable to leak fluid below said ram when said ram is lifted, and interchangeable cap means attachable to the upper end of said tubular housing and having a convex impact surface thereon, said impact surface extending into the upper end of said tubular ram when said ram is lifted, said convex impact surface having predetermined dimensions for metering the volume of fluid that can be contained within said tubular ram, and said cap having an opening formed therein for admitting fluid into said ram.

4,533,071
DISPENSING CLOSURE VALVE

Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 22, 1983, Ser. No. 525,075
Int. Cl.[3] B65D *47/08*
U.S. Cl. 222—498 8 Claims

1. A dispensing closure valve for a container comprising

a stem having a free end and an opposite end for attachment to the container,

said stem having an annular wall defining an opening through the stem, and

a closure made of plastic material such that it will flex in thin cross section,

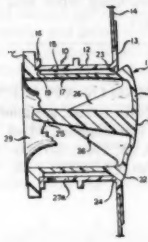
said closure having an annular axial wall, a radial wall engaging the free end of said stem, and a transverse wall curved and defining a convex surface extending from said annular axial wall and facing inwardly of the container,

said closure including a radially outwardly and axially inwardly inclined integral annular sealing surface at the juncture of said axial wall and transverse wall,

said stem having a downwardly and outwardly inclined

sealing surface engaged by said downwardly and inwardly inclined sealing surface of said closure, and

an actuator comprising a tab extending axially from the inner



surface of the transverse wall for manipulation of the closure to flex the axial wall and the transverse wall and thereby permit the contents to flow between the wall of the stem and the wall of the closure.

4,533,072

INFLATABLE WADER TREE

David R. Craig, 362 Evergreen, Holland, Mich. 49423

Filed Sep. 13, 1982, Ser. No. 416,843

Int. Cl.³ A43D *5/00*

U.S. Cl. 223—67 **4 Claims**

1. An inflatable tree for maintaining the shape of stored footwear, such as waders and the like, having a foot-receiving portion and an upstanding leg-receiving portion provided with an upper portion having an upwardly-opening, upper opening therein, said inflatable tree comprising:

inflatable and deflatable insert means, detachably receivable in the upper opening of said footwear, having a side wall and integral top and bottom walls;

said insert means, when inflated, being of such size and shape that said side wall is in sealing engagement with and detachably secured to said upper portion of said footwear and said bottom wall is vertically spaced from said foot receiving portion to form a sealed chamber within the footwear below the tree;

said insert means, when deflated, being of such size and shape that said side wall is not in sealing engagement with said upper portion to allow said insert means to be detached from said footwear;

openable and closeable air inlet means, at the upper end of said tree, for admitting air into said tree to inflate and expand said tree so that said side wall sealingly engages and is detachably secured to said upper portion of said footwear; and

air outlet means, in said bottom wall of said tree, for permitting air within said tree to escape outwardly therethrough to said sealed chamber to distend the lower portion of said footwear;

said air outlet means being of such construction as to permit substantially less air to pass outwardly therethrough than said air inlet means admits to said tree to allow said tree to inflate; and

means for overlying said tree to preclude the upward movement of said tree through said upper opening.

4,533,073

METHOD OF SPACING SHEETS AND MOVING GROUPS OF SPACED SHEETS

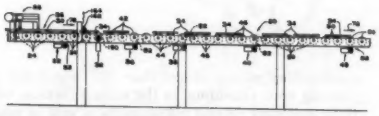
David A. Bier, Houston, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 968,335, Dec. 11, 1978, abandoned.

This application Jul. 14, 1980, Ser. No. 167,968

Int. Cl.³ C03B *33/02*

U.S. Cl. 225—4 **6 Claims**



1. Method of spacing articles and moving groups of spaced articles, comprising the steps of:

moving an article at a receiving speed from a first position onto conveying means;

accelerating the conveying means to increase the speed of the article toward a speed greater than the receiving speed;

decelerating the conveying means to move the article at the receiving speed;

practicing said moving step to provide a plurality of spaced articles on the conveying means;

practicing said accelerating step to maintain the spacing between adjacent articles and to provide a spacing between last received article moved onto the conveying means and next article to be moved onto the conveying means;

practicing said decelerating step to maintain the spacing between adjacent articles on the conveying means and to receive the next article from the first position;

sequentially repeating said practicing steps to provide a group of spaced articles on the conveying means;

increasing the speed of the conveying means to move the group of spaced articles at a discharge speed greater than the receiving speed; and

maintaining the speed of the group of spaced articles to remove the group of spaced articles provided during said repeating step from the conveying means at the discharge speed into a third position.

4,533,074

ANTI-BACKLASH FORMS FEED MECHANISM

Ronald R. van Thiel, Fremont, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1983, Ser. No. 565,483

Int. Cl.³ B65H *17/40;* **F16D** *1/08*

U.S. Cl. 226—74 **1 Claim**

1. An anti-backlash feeding mechanism for moving record material having perforations along its side edges, in forward and reverse directions, past a printing station, said feeding mechanism comprising:

rotatable driving means having a cross-sectional configuration of a given shape and including contiguous driving surfaces intersecting at a given angle,

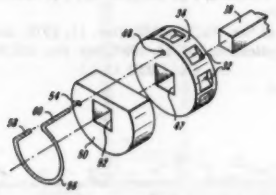
rotatable driven means having an opening therethrough with a cross-sectional configuration of substanially the same given shape and being slightly larger than said driv-

ing means cross-sectional configuration, for receiving said driving means in sliding engagement, and including contiguous driven surfaces intersecting at substantially the same predetermined angle, and

biasing means for urging said contiguous driving surfaces and said contiguous driven surfaces together, including

a hub located adjacent said driven means, said hub having a cross-sectional opening substantially identical to said driven means cross-sectional opening and encircling said drive means,

and a torsion spring encircling said drive means, said torsion spring comprising a planar arcuate portion circumscribing an arc of less than 360° and a pair of anchoring ends extending, in the same direction, substantially normally to said planar portion, one of said ends anchored in an opening in said driven means and the opposite end anchored in an opening in said hub, for urging said driven means and said hub in opposite directions relative to and into contact with said drive means, said hub further including access means for allowing said one of said ends of said torsion spring to pass to and into said driven means, whereby said torsion spring urges said driven means and said hub toward opposite corners of said driving means.



4,533,075

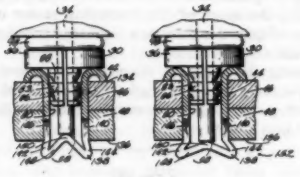
FASTENER SETTING TOOLS

Donald W. Hallock; Thomas M. Hartmann, both of Waupun, and Marvin Engebretson, Ripon, all of Wis., assignors to National Rivet & Manufacturing Company, Waupun, Wis.

Filed Apr. 28, 1983, Ser. No. 489,481

Int. Cl.³ B21J *15/04, 15/30, 15/10*

U.S. Cl. 227—55 **8 Claims**



1. A setting tool for fasteners of the type set by driving a pin into an opening surrounded by an interior wall of said fastener, said tool comprising:

A. a setting pin disposed along an axis and having a leading end and shaft for being driven into the opening of a fastener;

B. a collet for supporting a fastener while it is being positioned and set, said collet including plural segments enclosing an interior passage disposed along said axis, exterior surfaces formed by said segments, a leading end for being received within a fastener opening, outwardly opposed barbed jaws formed in the least two of said exterior surfaces adjacent said collet leading end, and spreader means for normally biasing said jaws apart into gripping contact with the interior wall of a fastener; and

c. drive means for propelling the leading end of said pin through the interior passage of said collet and axially engaging setting legs in the opening of a fastener carried on said collet, thereby setting said fastener; whereby the engagement between said jaws and a fastener prevents said tool from recoiling from said fastener while said fastener is being set.

4,533,076

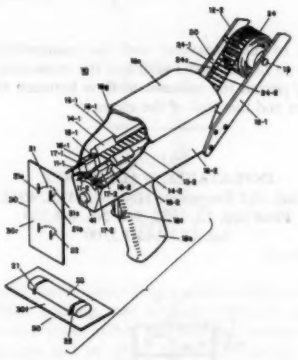
DISPENSING OF ATTACHMENTS

Donald L. Bourque, Millis, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Nov. 25, 1981, Ser. No. 325,074

Int. Cl.³ B25C *1/00*

U.S. Cl. 227—67 **15 Claims**



1. Apparatus for dispensing fasteners, each fastener having a pair of side members coupled by a link, comprising:

at least one slotted hollow needle;

first means for expelling individual ones of said fasteners through said needle, said means being reciprocable in an expulsion direction and a withdrawal direction;

second means for advancing a connected plurality of said fasteners;

third means for actuating said first and second means, said third means reciprocating said first and second means along an expulsion and a withdrawal direction, said third means moving said first means in the withdrawal direction at the same time as it moves said second means in the expulsion direction.

4,533,077

STOP DEVICE FOR A DRIVING PISTON IN A FASTENING MEMBER SETTING DEVICE

Peter Jochum, Meiningen, Austria, assignor to Hilti Aktiengesellschaft, Schaan Fürstentum, Liechtenstein

Filed Dec. 21, 1982, Ser. No. 451,922

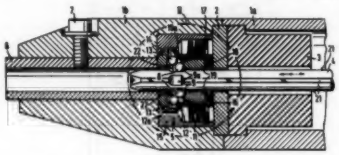
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151661

Int. Cl.³ B25C *7/00*

U.S. Cl. 227—156 **7 Claims**

1. Setting device such as for driving fastening members into a receiving material, comprising a casing, an axially elongated driving piston mounted in said casing arranged to be axially displaced relative to said casing by a propelling force directed against said driving piston, said driving piston having an axially extending outside surface thereon with a recess located in said outside surface, and a stop element mounted in said casing and engageable within said recess in said driving piston for securing said driving piston in a retracted position until the propelling force is directed against said driving piston, wherein the improvement comprises means for pressing said stop element

inwardly and transversely of the axis of said driving piston and securing said stop element in said recess, said means includes a first spring and a second spring each arranged for directing a biasing force against said stop element so that said stop element is directed radially inwardly into said recess with the biasing force of said first and second springs acting in the axial direction of said driving piston and being transmitted by said securing means directly to said stop element, said first spring having a greater spring force than said second spring and arranged for poviding a biasing action against said stop element so that the biasing action directs said stop element against said second spring as said driving piston experiences the propelling force and after said stop element is displaced radially outwardly out of said recess against the action of said means securing said stop element in said recess, securing means includes a pressure



transmitting member located radially outwardly from and in contact with said stop element when said stop element is located within said recess and said pressure transmitting member is arranged to transmit the biasing force of said first spring to said stop element, said pressure transmitting member is formed as a roller body, said securing means comprises an intermediate member located between said first spring and said pressure transmitting member, said first spring arranged to provide a biasing force extending in the axial direction of said working piston, said intermediate member having a contact face inclined obliquely to the axis of said driving piston and disposed in contact with said pressure transmitting member for transforming the axially directed biasing force of said first spring into a radially inwardly directed force acting through said pressure transmitting member against said stop element.

4,533,078

WELDING AND/OR CUTTING TORCH

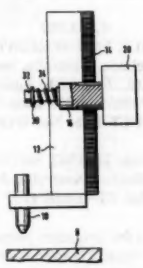
Werner Klein, Frankfurt, and Heinz Leo, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,731

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214717

Int. Cl.³ F16H *57/00*

U.S. Cl. 228—45 **2 Claims**



1. In a welding and/or cutting torch assembly having associated mounting and drive equipment for vertical operation of the torch, the improvement being said mounting including a gear rack and a pinion engaged with said gear rack, said drive equipment including a motor having a shaft, said shaft being externally threaded in its partially longitudinal zone, said pinion being internally threaded in its partial longitudinal zone, said pinion being threadably engaged with said shaft in such a manner that said pinion is selectively connected and disconnected to said shaft whereby said mounting is automatically disconnected from said shaft when said torch bumps into a workpiece with said pinion being disengaged from said shaft.

4,533,079

TRAY, PARTICULARLY FOR FOODSTUFFS

Karl R. Persson, Halmstad, Sweden, assignor to Sprinter System AB, Sweden

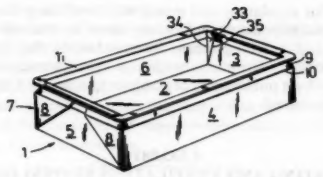
PCT No. PCT/SE82/00324, § 371 Date Jun. 7, 1983, § 102(e) Date Jun. 7, 1983, PCT Pub. No. WO83/01242, PCT Pub. Date Apr. 14, 1983

PCT Filed Oct. 8, 1982, Ser. No. 503,156

Claims priority, application Sweden, Oct. 9, 1981, 8106004

Int. Cl.³ B65D *5/24*

U.S. Cl. 229—31 R **8 Claims**



1. A tray produced from a stamped and creased blank made from carton or the like stiff material, said tray (1) consisting of a bottom (2) and four side walls (3–6), the latter being connected in pairs to each other by a corner structure (7) consisting of at least two substantially triangular areas (18, 19) in contact with adjacent side walls (3–6) having extensions in the form of folded-out flanges (11), lying in a plane parallel to the bottom (2) of the tray (1) and forming a continuous frame, for coaction with a separate lid with which the tray may be closed, characterized in that each of the side walls (3–6) consists of a lower and an upper wall portion, the former being folded up along a crease line (12–15) defining a bottom (2) such that it is substantially perpendicular to the bottom plane of the tray (1) and has a height from the bottom (2) attaining to at least half the tray height, said lower wall portion merging into the upper wall portion along a crease line (10) extending round the periphery of the tray (1) at a predetermined distance from the bottom crease line (12–15), said upper wall portion inclining at an acute angle to the bottom plane of the tray (1) and extending towards the interior of the tray (1) a distance substantially corresponding to the width of the continuous frame formed by the edge flanges (11), said frame being situated substantially within the outer contour of the bottom (2).

4,533,080

AIR TERMINAL—AIR HANDLER INTERFACE

William E. Clark, Syracuse, and James Carucci, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 528,813, Sep. 2, 1983, abandoned. This application Jan. 16, 1985, Ser. No. 691,730

Int. Cl.³ F24F *7/00*

U.S. Cl. 236—49 **5 Claims**

1. A variable air volume distribution system for conditioned air comprising:

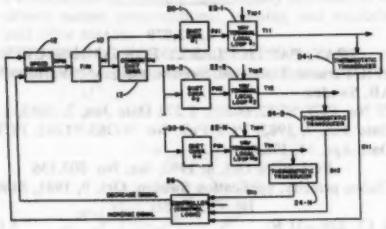
duct means including a main duct and a plurality of branches;

fan means for supplying variable amounts of conditioned air to said duct means;

means for controlling the amount of conditioned air supplied by said fan means;

at least one variable air volume terminal means connected to each of said branches for variably controlling the amount of conditioned air continuously supplied by each of said branches to its related zone; and

means for determining terminal satisfaction for at least one of said terminal means connected to each of said branches



and for regulating said means for controlling the amount of conditioned air supplied responsive to terminal satisfaction and including means for maintaining the number of dissatisfied terminals within a predetermined range whereby a minimum acceptable output for said fan means is maintained.

4,533,081

HEATING AND VENTILATION SYSTEM FOR VEHICLES

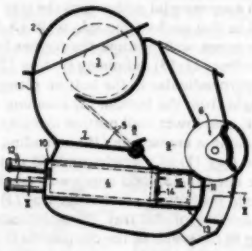
Bernd Forsting, Monchen-Gladbach; Joachim Zander, Frechen, and Jeske Gustav, Pulheim, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 6, 1983, Ser. No. 529,820

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242246

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 B **1 Claim**



1. A heating and ventilation unit for a motor vehicle comprising a mixing chamber having a housing containing a heat exchanger disposed within the vehicle interior, pipe connections extending from the heat exchanger through the rear wall of the mixing chamber and an aperture in a wall of the mixing chamber for enabling the heat exchanger to be withdrawn from the mixing chamber into the vehicle interior, wherein the aperture is formed in a side wall of the chamber and is dimensioned to permit passage of the heat exchanger and the rearwardly projecting connections, and a closure and support element is provided which includes portions insertable through the aperture and which, when inserted, is operative to support the heat exchanger within the chamber and prevent forward displacement of the exchanger away from the rear wall of the mixing chamber, the support and closure element including a support wall maintaining the heat exchanger in an installed position and a closure wall fixedly attached to one end of the support wall and closing at least part of the aperture, and wherein the other end of the support wall is provided with a catch and the housing is provided with a slot and the catch engages with the slot to maintain the support and closure element in its installed position.

4,533,082

PIEZOELECTRIC OSCILLATED NOZZLE

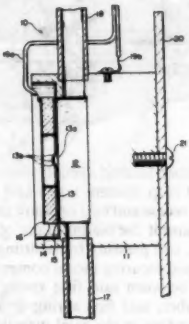
Naoyoshi Maehara, Nara; Kenkichi Hashido, Yamatokoriyama, and Hiroshi Hirata, Nara, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

Filed Oct. 14, 1982, Ser. No. 434,533

Claims priority, application Japan, Oct. 15, 1981, 56-165198; Oct. 15, 1981, 56-165202

Int. Cl.³ G01D *15/18*; B05B *3/14, 1/08*

U.S. Cl. 239—102 **11 Claims**



1. An arrangement for discharging liquid droplets comprising:

a housing including a forwardly opening chamber for holding liquid therein having an intake port connected to a liquid supply container;

a vibrating member secured to a forward end of said housing defining a front wall of said chamber in rearwardly pressure transmitting relationship with the liquid in said chamber and having at least one nozzle opening therein;

means for maintaining the static pressure of said liquid in said chamber equal to or lower than the static pressure forwardly of said nozzle opening; and

a piezoelectric transducer secured to said vibrating member for inducing therein a rearward displacement to cause a small quantity of liquid to be discharged forwardly through said nozzle opening.

4,533,083

DRIP FEED DEVICE FOR IRRIGATION PURPOSES

Alfred D. Tucker, Adelaide, Australia, assignor to RIS Irrigation Systems Pty. Ltd., Elizabeth, Australia

PCT No. PCT/AU82/00099, § 371 Date Feb. 7, 1983, § 102(e) Date Feb. 7, 1983, PCT Pub. No. WO83/00003, PCT Pub. Date Jan. 6, 1983

PCT Filed Jun. 21, 1982, Ser. No. 474,675

Claims priority, application Australia, Jun. 22, 1981, PE9385

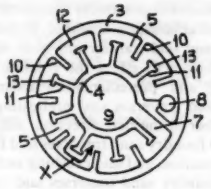
Int. Cl.³ B05B *1/02*

U.S. Cl. 239—542 **14 Claims**

1. A drip feed device for irrigation purposes in which a body (25) has a cylindrical wall (27) closed at one end by a transverse first wall (26) having on it an inlet member (32) for fluids, and a cap (17) is fitted to the body (25) having a cylindrical wall (20) and across it an intermediate transverse second wall (19) parallel to the first wall (26) and having through it an outlet aperture (18), the said body (25) and the said cap (17) forming between them a closed chamber (16) communicating on one side with the said inlet membrane (32) and on the other

side with the said outlet aperture (18), in which chamber (16) is a circular flow-restricting button (1) having flow-restricting channels (5) on each side of it connected in series between the said inlet member (32) and the said outlet aperture (18) of the said chamber (16), and having inwardly projecting flow-restricting baffles (10) and outwardly projecting flow-restricting baffles (11) extending into the said flow-restricting channels (5),

characterised in that the said chamber is bounded on the outside by the said cylindrical wall (20) of the said cap (17)



and the said button (1) has the inwardly projecting flow-restricting baffles (10) project into the space between and overlap the ends of the said outwardly projecting flow-restricting baffles (11) whereby flow is in counter direction around the ends of both the said inwardly flow-restricting baffles (10) and the said outwardly projecting flow-restricting baffles (11), and

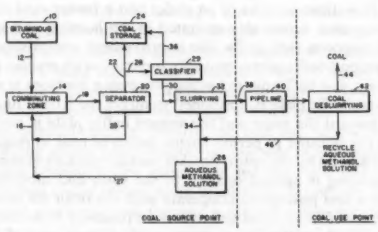
further characterised by the outwardly projecting flow-restricting baffles (11) having expanded ends (13) to increase resistance to flow in spaces (12) formed between the inwardly projecting flow-restricting baffles (10).

4,533,084

METHOD FOR COMMINUTING BITUMINOUS COAL USING AN AQUEOUS METHANOL SOLUTION

Ju-Nam Chew, and Joseph G. Savins, both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,527
Int. Cl.³ B02C *19/00*
U.S. Cl. 241—1 **20 Claims**



1. A method for comminuting bituminous run-of-mine crushed coal comprising contacting said coal in a comminution zone with an aqueous methanol solution of a strength of about 51 to about 75 volume percent sufficient to give substantially better comminution reactivity than substantially anhydrous methanol and maintaining said contact for a time sufficient to comminute a substantial portion of said coal to a predetermined particle size.

4,533,085

METHOD FOR PRODUCTION OF A SUSPENSION OF ZIRAM

Jay A. Woods; Verle W. Woods, and Dale G. Woods, all of P.O. Box 1016, Yakima, Wash. 98907

Filed Jul. 29, 1983, Ser. No. 518,749
Int. Cl.³ B02C *19/12*
U.S. Cl. 241—1 **2 Claims**

1. A method of synthesizing zinc dimethyl dithiocarbamate (Ziram) in a flowable water-based suspension, comprising the following steps:

continuously agitating an initial suspension containing a mixture of finely divided zinc oxide and carbon disulfide and liquid components including an emulsifier and water;

thoroughly dispersing finely divided dimethyl amine within the initial suspension;

continuing agitation of the suspension while maintaining it at a preselected reactive temperature range for a time period sufficient to assure that reactions between the mixture of finely divided zinc oxide and carbon disulfide and the finely divided dimethyl amine is completed by production of Ziram in the suspension;

the proportion of liquid components in the initial suspension being preselected so as to maintain the suspension in a fluid state suitable for agitation at all times while the reactions are occurring;

and subsequently mixing the suspension while adding fat, emulsifier or water as required to produce a stable flowable Ziram suspension.

4,533,086

PROCESS FOR GRINDING GRAPHITE

Jack D. Junttila, Country Club Hills, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 27, 1982, Ser. No. 453,071
Int. Cl.³ B02C *23/18, 23/36*
U.S. Cl. 241—16 **11 Claims**

1. A process for grinding graphite comprising:

(1) forming a mixture of graphite and a graphite grinding aid;

(2) grinding the mixture of graphite and graphite grinding aid to reduce the size of the graphite;

(3) forming an aqueous slurry of the graphite particles, graphite grinding aid and water;

(4) adding an amount of hydrocarbon oil to the aqueous slurry with agitation to form graphite-oil agglomerates;

(5) separating the graphite-oil agglomerates from the grinding aid and water; and

(6) removing hydrocarbon oil from the graphite-oil agglomerates to provide graphite particles reduced in size.

4,533,087

APPARATUS WITH HEAT EXCHANGE MEANS AND TRANSFER PIPE FOR TREATING SOLID, GRANULAR AND AGGREGATE MATERIALS

Vagn Deve, East Washington, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 8, 1983, Ser. No. 521,494
Int. Cl.³ B02C *19/12*
U.S. Cl. 241—65 **7 Claims**

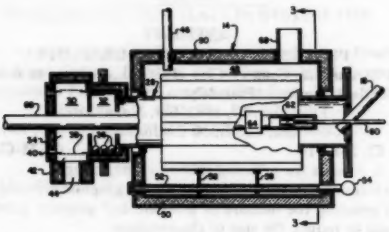
1. An apparatus for effecting the preheating, prereclamation, crushing, sizing, post reclamation and cooling of used foundry sand comprising:

a. a preheating and prereclamation chamber including inlet means provided adjacent one end thereof and outlet means provided adjacent the other end thereof, said inlet means providing an entrance to said preheating and prereclamation chamber for used foundry sand supplied thereto at a first temperature, said preheating and prereclamation chamber having a corrugated interior surface and being operative to retain the used foundry sand therewithin while the used foundry sand is being both preheated to a second temperature and prereclaimed during

the course of the passage thereof in a first direction through said preheating and prereclamation chamber, said corrugated interior surface being operative for purposes of effecting a mixing of the used foundry sand during the passage thereof through said preheating and prereclamation chamber and for purposes of providing said preheating and prereclamation chamber with increased heat transfer surface, said outlet means providing an exit from said preheating and prereclamation chamber for the used foundry sand following the preheating thereof to the second temperature and the prereclamation thereof in said preheating and prereclamation chamber;

b. a transfer chamber having one end thereof cooperatively associated with said outlet means of said preheating and prereclamation chamber for receiving the used foundry sand while at the second temperature from said preheating and prereclamation chamber, said transfer chamber being of lesser dimensions than said preheating and prereclamation chamber and having its longitudinal axis coincident with the longitudinal axis of said preheating and prereclamation chamber;

c. a crushing and sizing chamber having one end thereof cooperatively associated with the other end of said transfer chamber for receiving the used foundry sand while at the second temperature therefrom and having its longitudinal axis coincident with the longitudinal axis of said transfer chamber, said crushing and sizing chamber including a crushing area and a sizing area, said crushing area having a multiplicity of balls housed therewithin, said



multiplicity of balls being operative to effect the disintegration of friable lumps of used foundry sand during the passage of the used foundry sand through said crushing area of said crushing and sizing chamber, said sizing area having an opening formed therewithin and including screen means positioned over said opening, said screen means being operative to sift the used foundry sand during the passage thereof through said sizing area of said crushing and sizing chamber so as to effect a separation of oversize particles of used foundry sand from particles of used foundry sand of desired size;

d. post reclamation and cooling chamber having reentry means formed adjacent one end thereof and discharge means formed adjacent the other end thereof, said reentry means providing an entrance to said post reclamation and cooling chamber for used foundry sand supplied thereto at a third temperature, said post reclamation and cooling chamber being operative to retain the used foundry sand therewithin while the used foundry sand undergoes cooling during the course of the passage thereof in a second direction through said post reclamation and cooling chamber, said post reclamation and cooling chamber being positioned in surrounding relation to said preheating and prereclamation chamber such that by virtue of the heat transfer between the used foundry sand during the course of the passage thereof while at the third temperature through said post reclamation and cooling chamber and the used foundry sand during the course of the passage thereof while at the first temperature through said preheating and prereclamation chamber the used foundry sand within said preheating and prereclamation chamber while traversing said preheating and prereclamation chamber in the first direction is preheated from the first temperature to the second temperature and the used foundry sand within said post reclamation and cooling chamber while traversing said post reclamation and cooling chamber in the second direction is cooled from the third temperature to the fourth temperature, said discharge means providing an exit from said post reclamation and cooling chamber for the used foundry sand following the cooling thereof within said post reclamation and cooling chamber from the third temperature to the fourth temperature; and

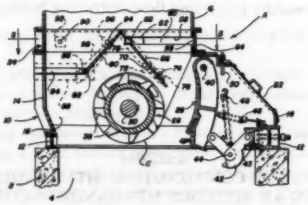
e. rotating means cooperatively associated with said preheating and prereclamation chamber, said crushing and sizing chamber, and said transfer chamber, said rotating means being operative to effect the rotation in unison of said preheating and prereclamation chamber as the used foundry sand traverses said preheating and prereclamation chamber in the first direction, said transfer chamber as the used foundry sand traverses said transfer chamber in the first direction, and said crushing and sizing chamber as the used foundry sand traverses said crushing and sizing chamber.

4,533,088

FROZEN COAL CRACKER

Edgar L. Lyston, St. Louis, Mo., assignor to American Pulverizer Company, St. Louis, Mo.

Filed Aug. 3, 1983, Ser. No. 519,926
Int. Cl.³ B02C *13/286*
U.S. Cl. 241—186.3 **5 Claims**



1. In a machine for accommodating coal flow during warm weather conditions and cold weather conditions and for further processing the coal during cold weather conditions when small lumps of coal are frozen together to form large lumps, and in which a housing having side walls defines a passage for coal flow from an inlet to an outlet and a frozen coal disintegrating rotor is operably mounted in the housing and spaced from opposite side walls; the improvement comprising: first and second baffle plates movably mounted with respect to the housing, said baffle plates having processing positions in which the first baffle plate is positioned to direct the frozen lumps of coal toward the rotor and the second baffle plate is retracted from the housing to permit frozen lumps of coal to reach and be broken up by the rotor; breaker means operably mounted in the housing in spaced relation to the rotor and movable between a first position to cooperate with the rotor for breaking up lumps of frozen coal and a position removed from cooperation with the rotor; means for arranging said pair of baffle plates in the housing in adjacent cooperating by-pass positions over the rotor for protecting the rotor from contact by the entering coal flow, the baffle plates when in their cooperating by-pass positions generally forming a peak over the rotor with the first plate sloping downwardly from the peak toward one side of the rotor and the second plate sloping downwardly from the peak toward the other side of the rotor; and means for positioning said breaker means in its retracted position relative to the rotor when the baffle plates are in the cooperating by-

pass positions, so that coal flows over the baffle plates and past both sides of the rotor.

4,533,089

APPARATUS FOR MAKING CRISSCROSS-WOUND LAYERS TO FORM WOUND BODIES

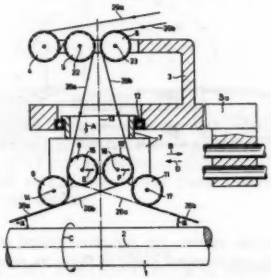
Bruno Sartor, Niederzier-Krauthausen, and Klaus Rode, Jülich, both of Fed. Rep. of Germany, assignors to Uranit GmbH, Jülich, Fed. Rep. of Germany

Filed Sep. 29, 1983, Ser. No. 536,957

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3236946

Int. Cl.³ B65H *54/64, 81/08*

U.S. Cl. 242—7.21 **4 Claims**



4. In an apparatus for making a rotationally symmetrical body formed of crisscross-wound layers, the apparatus including a winding mandrel rotatable about a longitudinal mandrel axis; a carriage arranged for reciprocating travel along said mandrel and thread laying means mounted on said carriage; the improvement in said thread laying means comprising:

(a) a pivotal device having a pivot axis oriented perpendicularly to said mandrel axis;

(b) spaced first, second, third and fourth thread laying rollers mounted for rotation on said pivotal device and each having a roller shaft; the roller shafts extending parallel to one another and being situated at points of an imaginary equilateral trapezoid having a plane perpendicular to the roller shafts; said first and fourth thread laying rollers being outer rollers and said second and third thread laying rollers being inner rollers; each said thread laying roller having a plurality of circumferential grooves for simultaneously guiding and depositing on said mandrel a plurality of parallel-running threads; the first and second thread laying rollers being situated on one side of said pivot axis and forming a first roller pair and the third and fourth thread laying rollers being situated on an opposite side of said pivot axis and forming a second roller pair; within each roller pair the grooves of one thread laying roller being in alignment with the grooves of the other thread laying roller; the grooves of said first roller pair being offset with respect to the grooves of the second roller pair in a direction parallel to said roller shafts by one half of the center-to-center distance between adjoining grooves; and

(c) first and second thread supplying rollers for guiding threads to said first and second roller pairs, respectively; said thread supplying rollers being supported for rotation externally of said pivotal device.

4,533,090

APPARATUS FOR TENSIONING BAND OR WEB PORTIONS RUNNING OFF AND ONTO TWO ROLLERS

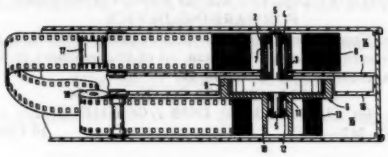
Otto Blaschek, Ascheim, Dornach, Fed. Rep. of Germany, assignor to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG., Munich, Fed. Rep. of Germany

Filed Jul. 19, 1983, Ser. No. 515,152

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1982, 3227137

Int. Cl.³ G11B *5/48, 5/78*

U.S. Cl. 242—75 **7 Claims**



1. Apparatus for tensioning first and second portions of a strip or web unwinding from a feed roller and winding onto a takeup roller, such as film strip in a film cassette or camera, said apparatus comprising:

a housing wall;

a D.C. motor supported in the housing wall and including a stator and an armature shaft, both the stator and the armature shaft being rotatably carried in the housing wall, so that the stator and armature shaft are each rotatable relative to each other and are each rotatable relative to the housing wall;

first driving connection means extending between and interconnecting the rotatably mounted stator and one of the rollers;

second driving connection means extending between and interconnecting the rotatably mounted armature shaft and the other of the two rollers;

and feed means positioned to drivingly contact the strip or web between the rollers for feeding an unrolled third portion of the strip or web in untensioned condition while the first and second portions are in tension.

4,533,091

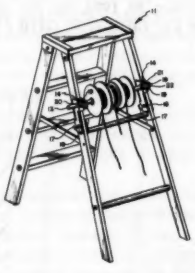
PORTABLE MULTIPLE SPOOL WIRE DISPENSER

Reed H. Knight, 2011 Todd Way, and Val L. Longmore, 4374 Alice Way, both of Salt Lake City, Utah 84199

Filed May 10, 1984, Ser. No. 608,701

Int. Cl.³ B65H *49/00*

U.S. Cl. 242—129.6 **3 Claims**



1. A plural spool wire dispensing device for mounting on the spaced apart generally upright support legs of a free standing ladder said device comprising first and second brackets each bracket having a pair of oppositely facing primary channels secured in spaced relationship by an arm, said primary chan-

nels being adapted to fit over one of said support legs on a free standing ladder, clamp means on each bracket for securing it in selected position on a support leg on which it is mounted, an elongated shaft of length to at least span the distance between said brackets when the same are on said support legs, and means on each bracket for receiving and supporting opposite end portions of said shaft said last named means comprising on each bracket a secondary channel extending outwardly from and transverse to one of said primary channels.

4,533,092

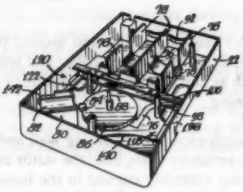
VIDEO CASSETTE RAPID REWINDING/FAST FORWARDING DEVICE

Marino Cecchi, Lincolnshire; Gregory J. Borucki, Hinsdale, and Lawrence R. Happ, Mundelein, all of Ill., assignors to Suncom, Incorporated, Wheeling, Ill.

Filed May 29, 1984, Ser. No. 614,954

Int. Cl.³ B65H *59/38*; G03B *1/04*; G11B *15/32*

U.S. Cl. 242—186 **10 Claims**



1. A device for rapidly rewinding and fast forwarding a conventional video tape cassette having a door along its front edge and first and second tape reels, comprising a housing having a surface for receiving the cassette thereon; rotatable drive and idler sprockets on said surface, each for operatively engaging a respective one of the reels in accordance with the orientation of the cassette on said surface; motor means in said housing for rotating said drive sprocket in first and second directions; and means responsive to the orientation of the cassette on said surface for controlling operation of said motor means to rotate said drive sprocket in said first direction when said drive sprocket engages the first reel and in said second direction when said drive sprocket engages the second reel to rapidly rewind or fast forward the cassette.

4,533,093

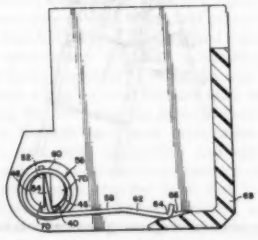
TAPE CASSETTE DUST DOOR SPRING ASSEMBLY AND METHOD FOR ASSEMBLING SAME

Paul J. Gelardi, Cape Porpoise, and Robert B. MacLeod, Jr., Biddeford, both of Me., assignors to Shape Inc., Biddeford, Me.

Filed Nov. 30, 1983, Ser. No. 556,545

Int. Cl.³ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—197 **15 Claims**



1. A spring assembly for a tape cassette dust door, comprising:

(a) a polar member with a first end fixed to the dust door and a second free end, the second free end being rounded and having formed therein a first slit and a second relatively narrower slit extending from the first slit toward the first, fixed end of the polar member and the polar member being fixed substantially perpendicular to a surface of the dust door; and

(b) a spring having a first leg, a coiled body and a second leg, the first leg being received by the second slit of the polar member, the body surrounding the polar member and the second leg of the spring being urged against the dust door, wherein the spring is held in torsion relationship.

4,533,094

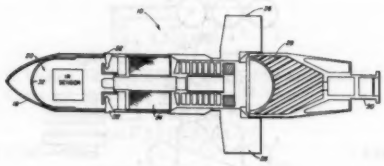
MORTAR SYSTEM WITH IMPROVED ROUND

Norman P. Geis, Kensington, N.H., and Edward A. Chambers, Acton, Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 434,783, Oct. 18, 1982, abandoned. This application Aug. 23, 1984, Ser. No. 643,758

Int. Cl.³ F42B *13/32*

U.S. Cl. 244—3.22 **1 Claim**



1. In a mortar system, an improved round adapted to be guided during the terminal phase of flight its, said round comprising:

(a) a mortar shell having a first and a second nose cone, said first cone shaped as an ogive overlying said second cone, said second cone shaped as a hemisphere and fabricated from a material substantially transparent to infrared energy, said shell being spin-stabilized during the initial stage of flight its;

(b) an infrared seeker, mounted in said shell behind the second nose cone and gyroscopically stabilized to derive boresight error signals proportional, in inertial space, to the line-of-sight rate between said round and a selected target;

(c) wings, deployed from the rear of the mortar shell during the terminal phase of flight the of said round, to decrease the roll rate of said shell below the rate required for spin stabilization; and,

(d) jet control means, responsive to the boresight error signals out of the infrared seeker, to change the flight path of said shell to null said boresight error signals.

4,533,095

DUCT MEANS FOR AIRCRAFT

Ivan R. Yates, Kingston-upon-Thames, England, assignor to British Aerospace Public Limited Company, London, England

Filed Sep. 2, 1983, Ser. No. 528,963

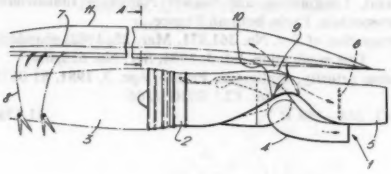
Claims priority, application United Kingdom, Sep. 3, 1982, 8225181

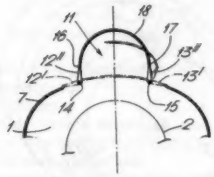
Int. Cl.³ B64C *29/04*

U.S. Cl. 244—23 D **9 Claims**

1. An aircraft having propulsive fluid outlet means and in which fluid is required to be ducted from a source of pressurized fluid to another part of said aircraft to be exhausted to provide a propulsion force, including elongate duct means having spaced inlet and outlet means, said inlet means being in flow communication with said source of pressurized fluid, and said outlet means being in flow communication with said pro-

pulsive fluid outlet means, said duct means including a relatively flexible imperforate panel element biased such that on introduction of pressurized fluid into said duct, said duct is caused to expand from a non-fluid conducting condition in





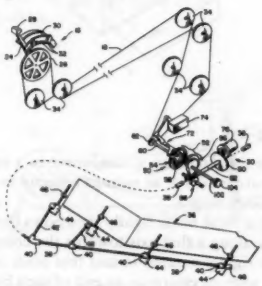
which said panel element together with adjacent external surface regions of said aircraft defines a substantially continuous surface and a fluid conducting condition of relatively large cross-sectional area in which said panel element protrudes from the aircraft surface.

4,533,096

HIGH LIFT SYSTEM CONTROL ASSEMBLY

Michael E. Baker, Kent, and Thomas M. Baker, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1982, Ser. No. 454,559
Int. Cl.³ B64C *13/32, 13/38*
U.S. Cl. 244—75 R **16 Claims**



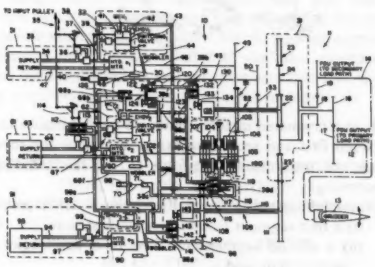
16. A control assembly for deployment of aircraft wing flaps, comprising an input cam mechanism, a feedback cam mechanism and a summing lever means operatively interconnecting said cam mechanisms for mechanically summing independent inputs therefrom to yield a mechanical output signal for actuating flap deployment means, wherein said input cam mechanism is comprised of a cam rotationally operable in response to a command input signal and a cam follower in mating engagement therewith for deflecting movement with rotation thereof to provide a first input signal to a first input leg of said summing lever characteristic of a predetermined flap configuration, and said feedback cam mechanism is comprised of a cam rotationally operable in response to movement of said flaps and a cam follower in mating engagement therewith for deflecting movement with movement of said flaps to provided a second input signal to a second input leg of said summing lever characteristic of the existing flap configuration; wherein said summing lever provides said mechanical output signal at an output leg disposed at a common point with said input legs, which output signal is derived as a sum of said input signals when said commanded flap configuration differs from said existing flap configuration.

4,533,097

MULTI-MOTOR ACTUATION SYSTEM FOR A POWER DRIVE UNIT

Allyn M. Aldrich, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 11, 1983, Ser. No. 512,798
Int. Cl.³ B64C *13/42*
U.S. Cl. 244—78 **22 Claims**



1. A hydromechanical system for a power drive unit having an output shaft drivingly coupled to a load, said system including in combination;

a differential means having first and second members drivingly coupled through a third member to said output shaft and said load,

first, second and third hydraulic motors each operating from an associated controllable independent hydraulic system,

said first and third hydraulic motors having outputs drivingly coupled respectively to said differential means first and second members,

a clutch means having an input shaft drivingly coupled to be driven by an output of said second hydraulic motor, said clutch means having first and second outputs respectively drivingly coupled to said differential means first member and said second member,

clutch actuation means controllingly coupled to said clutch means to cause said clutch actuation means to couple said input shaft to either said first or said second outputs,

said clutch actuation means having a normally neutral operative state whereby neither said first or second outputs are coupled to said input shaft,

hydraulic failure detection means controllingly coupled to the independent hydraulic system associated with said second hydraulic motor and to said clutch actuation means, and

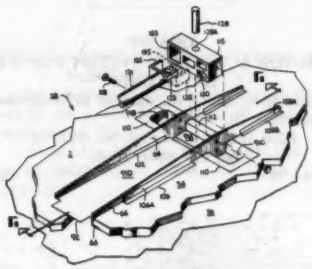
said hydraulic failure detection means responsive to a hydraulic system failure in said first and third hydraulic motor independent hydraulic systems to thereby cause said clutch actuation means to connect said second hydraulic motor output through one of said clutch means first and second outputs, dependent upon which one of said first and third hydraulic systems has failed whereby said load is always driven by at least two hydraulic motors via said differential means when one of said hydraulic systems of either said first or third hydraulic motors experiences a failure.

4,533,098

THRUST REVERSER ATTACHMENT

Bruno Bonini; Raymond G. Cook; Carl F. Holdren, all of Cincinnati, Ohio, and Everett A. Johnston, Baldwin, Md., assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 20, 1983, Ser. No. 505,586
Int. Cl.³ B64D *33/04;* B64C *1/00*
U.S. Cl. 244—110 B 6 Claims



1. In a laminated material having a medial matrix laminated between first and second skins, an apparatus for receiving a force and transmitting the force to the laminated material, comprising:

(a) two elongated substantially parallel brackets each having

(i) a first segment fastened to the first skin,

(ii) a second segment fastened to a first region of the second skin, and

(iii) a third segment fastened to a second region of the second skin, the first and second regions being separated by a cavity in the second skin; and

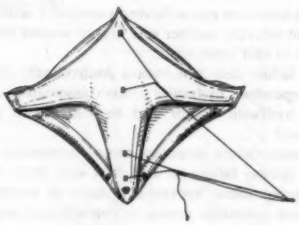
(b) a yoke fastened to the two elongated brackets and located in the cavity for receiving the force at a thrust point positioned approximately coplanar with the second skin.

4,533,099

KITE

Keith Stewart, Melbury, Osmond, Dorchester, United Kingdom DT20LS

Filed Sep. 24, 1982, Ser. No. 423,288
Int. Cl.³ A63H *27/08;* B64C *31/06;* B64B *1/50*
U.S. Cl. 244—153 R 23 Claims



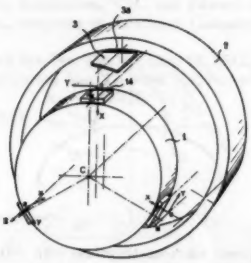
1. A kite having an inflatable body and flaps each of sheet material with each having a trailing edge, and means for varying the yaw of the kite in flight, said means being an individual independently inflatable tube provided along the trailing edge of each flap.

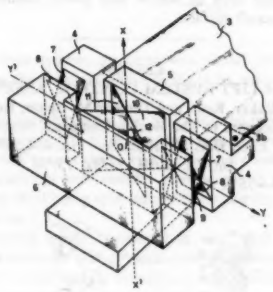
4,533,100

MOUNTING DEVICE FOR SUPPORTING A COMPONENT, ESPECIALLY A MIRROR OR AN ANTENNA REFLECTOR IN A SPACECRAFT

Jacques Paseri, Fontenay-les-Briis, France, assignor to R.E.-.O.S.C. (Recherches et Etudes d'Optique et de Sciences Connexes), Longjumeau and Societe Nationale Industrielle et Aerospatiale, Paris, both of, France

Continuation of Ser. No. 361,871, Mar. 25, 1982, abandoned.
This application Jul. 3, 1984, Ser. No. 626,484
Claims priority, application France, Apr. 3, 1981, 81 06724
Int. Cl.³ B64G *1/66*
U.S. Cl. 244—158 R 11 Claims





1. A device for mounting a component in a support, especially an optical element or an antenna reflector in a spacecraft, said device comprising:

a first flexible plane blade rigidly secured to the support and extending along a first axis towards the component;

a first piece rigidly secured to said first blade and to which are fixed without clearance an end of each blade of a first pair of flexible plane blades, said blades of said pair extending in two secant planes the intersection of which is parallel to a second axis;

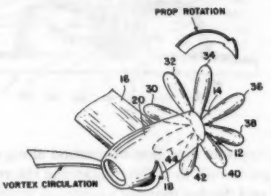
a second piece rigidly secured to said component and to which are fixed without clearance an end of each blade of a second pair of flexible plane blades, said blades of said second pair extending in two other secant planes the intersection of which is parallel to a third axis, said first, second and third axes being arranged according to the three directions of a triorthogonal system; and

an intermediate piece to which are fixed without clearance the other ends of the blades of said first pair and of said second pair; whereby said component may translate in a plane containing said first and third axes and rotate about said second and third axes, with respect to said support.

4,533,101
WINGTIP VORTEX PROPELLER

James C. Patterson, Jr., Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed Feb. 2, 1984, Ser. No. 576,308
Int. Cl.³ B64D 27/02
U.S. Cl. 244—199 11 Claims



1. An apparatus for generating thrust from and attenuating a vortex, comprising:

a moving vehicle;

lift-producing surface means on said vehicle inducing a wingtip vortex having a core and a crossflow;

power generating means; and

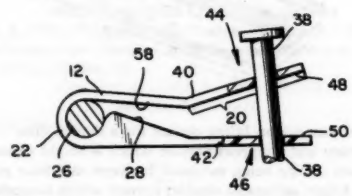
propeller means powered by said power generating means and positioned at the wingtip aft of the wing in a pusher configuration located in the highest energy area of said crossflow for simultaneous attenuating the vortex and converting a portion of the crossflow energy to vehicle thrust;

said propeller means having means for rotating the propeller means in a direction opposite to the flow of the wingtip vortex.

4,533,102
GROUNDING WIRE CLAMPING DEVICE

David R. Ferrell, 4125 Townhouse Rd., Apt. K, Richmond, Va. 23228

Filed Aug. 17, 1983, Ser. No. 523,866
Int. Cl.³ F16L 3/08
U.S. Cl. 248—74.1 9 Claims



1. A wire clamping and retaining device comprising:

first and second leg members;

connecting means connecting said first and second leg members to define a cavity for accepting a wire therein and to establish a normal position of said first and second leg members wherein a predetermined separation distance is defined therebetween and wherein said first and second leg members are angularly oriented relative to one another, said connecting means including biasing means for establishing a bias force to bias said first and second leg members into said normal position and to exert a clamping force against the wire in said cavity to prevent the device from slipping axially relative to the wire;

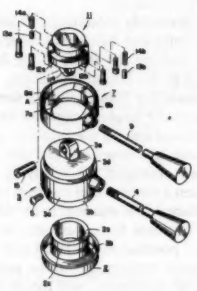
means associated with said first leg member defining a surface upwardly inclined in the direction of said connecting means, said inclined surface defining means for (a) establishing with a portion of said second leg member a wedge-shaped entranceway to said cavity through which said wire passes as said device is laterally moved relative to said wire, and (b) upwardly displacing the wire as the wire moves along said surface when said device is moved laterally relative to the wire to thereby cause said wire to assume a wedged relationship between said surface and said portion of said second leg member, wherein continued lateral movement of said device relative to said wire responsively effects relative outward displacement of said first and second leg members by virtue of the wedged relationship of the wire between said inclined surface and said portion of said second leg member to permit the wire to gain access to said cavity, said connecting means biasing said second leg member into said normal position upon acceptance of the wire in said cavity to frictionally engage the wire to substantially prevent axial slippage of the device relative thereto; and

means associated with said first and second leg members for defining paired nail-accepting apertures, said biasing means by virtue of biasing said first and second leg members into said angularly oriented normal position angularly offsetting one aperture relative to the other aperture to thus frictionally hold a nail spanning said first and second leg members and disposed in said paired apertures.

4,533,103
DEVICE IN UNIVERSAL HEAD FOR TILTING CAMERA TO THE LEFT AND RIGHT

Tatsuo Ina, 22-11 Sendagi 1-chome, Bunkyo-ku, Tokyo, Japan (112)

Filed Mar. 9, 1982, Ser. No. 356,388
Int. Cl.³ F16M 11/12
U.S. Cl. 248—179 8 Claims



1. A device for use in a universal head for a camera and adapted to tilt the camera in the lateral directions, said device comprising in combination:

(a) a tripod with legs, said legs having an upper portion, a table base plate (2) mounted on said upper portion, with a boss (2*a*) protruding from the center thereof, a rotary table (3), mounted on said boss (2*a*) said rotary table (3) having an upper neck (3*d*);

(b) a hollow rotary sleeve means (7) mounted on said neck (3*d*) with tapered cam portions (8*a* 8*b*), said hollow rotary sleeve means (7) being mounted on said rotary table (3) for rotation in the horizontal plane;

(c) a tilt bed (11) attached to said boss (2*a*) cooperating with said rotary table (3) in clamping said hollow rotary sleeve means (7) therebetween, said tilt bed (11) being provided with cam receiving portions (12*a*, 12*b*) projecting downwardly therefrom and adapted to contact said cam portions (8*a*, 8*b*), so that a camera that is attached to said tilt bed (11) is tilted in one or the other lateral directions together with said tilt bed (11) as said rotary sleeve means (7) is rotated; and,

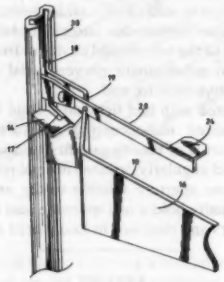
(d) handle means operatively coupled to said device to rotate said sleeve means.

4,533,104

INFINITELY ADJUSTABLE SUPPORT SYSTEM

George M. Bell, Revere, Mass., assignor to Hillel Stavis, Cambridge, Mass.

Filed Sep. 19, 1983, Ser. No. 533,359
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—245 **10 Claims**



1. Article support system comprising:

(a) means defining at least one structural support elongated channel;

(b) means defining at least one support bracket with a pivotable end insertable into said channel;

(c) means defining a latch member for latching and unlatching the bracket into and out of locking frictional engagement with the channel;

(d) means for pivotably mounting the latch from the bracket in a longitudinal and latitudinal direction;

(e) means for locking the latch to the bracket in a stressed arrangement in the latching position;

(f) fulcrum means for transmitting a first latch stress to the bracket end in the latching position and an opposing latch stress distributed among the fulcrum, and discrete areas of the latch and the bracket, the said means being constructed and arranged for applying primary frictional force between a bracket end inserted in the channel and an interior surface of the channel in the locked position and a secondary frictional force between the bracket and latch in the locked position as the latch and bracket go through relative pivotal movement about said pivot means and relative lateral movement, said forces being maintained by said means for locking.

4,533,105

TILTABLE DISPLAY MONITOR ASSEMBLY

Ross E. Cornwell, Jr., Elmhurst; John F. Czech, Mount Prospect, and James D. Domoleczny, Vernon Hills, all of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Apr. 27, 1984, Ser. No. 605,016
Int. Cl.³ A47G *29/00*
U.S. Cl. 248—371 **9 Claims**

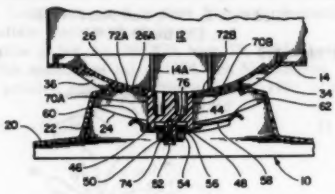
1. A tiltable assembly for a display monitor haaving a convex lower portion for stably positioning said display monitor over a continuum of tilt angles, said assembly base comprising:

a housing having a concave upper portion adapted to receive the convex lower portion of said display monitor when positioned thereupon;

first and second parallel, elongated, arcuate guide rails located in said concave upper portion of said housing;

coupling means for slidably engaging a lower portion of said display monitor with said first and second guide rails, wherein the center of gravity of said display monitor exerts a rotational movement urging said display monitor in a first direction of rotation along said first and second guide rails; and

biasing means coupling a lower portion of said display monitor to said housing for urging said display monitor in a



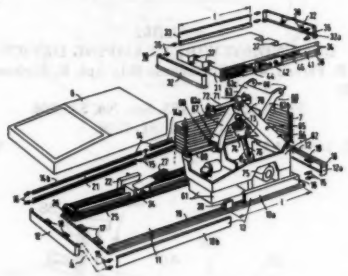
second, opposite direction of rotation along said first and second guide rails in counterbalancing the rotational moment of said display monitor's center of gravity in providing for the stable positioning of said display monitor over a continuum of tilt angles.

4,533,106

LIFTING DEVICE FOR A DENTIST CHAIR

Klaus Stöckl, Heppenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 22, 1983, Ser. No. 516,212
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1982, 3228834
Int. Cl.³ A61G *15/00*
U.S. Cl. 248—421 **6 Claims**



1. A scissor action lifting device for a dentist chair with a base portion and a support portion which is height adjustable, said lifting device being mounted between said base portion and said height adjustable support portion which comprises, in combination:

(a) a pair of support arms, each arm having two arm parts, said arm parts comprising a longer arm part and a shorter arm part, said arm parts being joined at the area near one of their respective ends by a cross reinforcement member lying therebetween;

(b) a joint pivotally securing the support arms together in a manner that their shorter arm parts are on one side of the joint and their longer arm parts extend past the joint on another side thereof to form a scissors-type configuration which pivots about a horizontal axis; and

(c) upper and lower horizontal guides, each being slidably attached at an end of a corresponding one of the longer arm parts on said another side of said joint, the upper horizontal guide being attached to said support portion and the lower horizontal guide being fixed, whereby application of lifting or lowering forces to at least one of

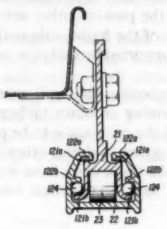
the support arms allows the support portion to be lifted or lowered.

4,533,107

SEAT TRACK APPARATUS FOR VEHICLE SEAT

Hiroshi Okazaki, and Motoi Hyodo, both of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 14, 1983, Ser. No. 458,036
Claims priority, application Japan, Jan. 21, 1982, 57-7850
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—430 **8 Claims**



1. A seat track apparatus for a seat of a vehicle, having a chamber floor comprising:

an upper rail fixedly attached to a lower portion of said vehicle seat and having a reverse U-shaped cross-sectional configuration so as to form opposed shoulders and opposed side walls and including a first pair of projecting portions longitudinally projecting from said opposed shoulders and a second pair of projecting portions longitudinally, laterally extending from said opposed side walls; and

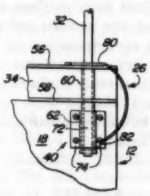
a lower rail fixedly attached to said floor of said vehicle chamber and having a U-shaped cross-sectional configuration, and including a pair of upper flanges at an upper end portion thereof and a pair of projecting portions corresponding to said pair of projecting portions of said upper rail at said opposed side walls.

4,533,108

DRAFTING TABLE ATTACHMENT

David A. Willer, Welland; John Rosbak, Fonthill, and Daniel G. McCombs, Port Colborne, all of Canada, assignors to Deere & Company, Moline, Ill.

Filed Oct. 17, 1983, Ser. No. 542,614
Int. Cl.³ A47G *1/16*
U.S. Cl. 248—467 **11 Claims**



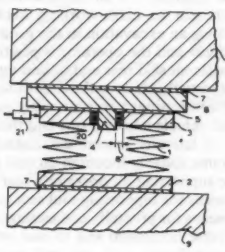
1. In a desk having a generally horizontal work surface with front and rear edges and a base extending downwardly from the work surface for supporting the surface above the floor, said base including a rear wall generally aligned with the rear edge, an upright document holder, comprising: a pair of upright rods, first and second rigid transverse members connected to the rods and extending therebetween in generally parallel, vertically spaced relationship, said transverse members transversely spacing the vertical rods and maintaining them in substantially fixed relationship with the uppermost transverse member defining the upper extremity of the holder, said rods including lower portions extending downwardly in parallel relationship from the lowermost transverse member, wherein the length of the lower portions of the rods are substantially greater than the vertical space between the first and second transverse members, bracket means connected to the desk and slidably receiving the lower portions of the rods for adjustably supporting transverse members above the rear edge of the work surface, means for securing the rods in a preselected adjusted vertical position relative to the work surface, and wherein the upright rods and transverse members form a rigid assembly movable with respect to the bracket means between a lowermost position wherein the ends of the lower portions of the rods are closely adjacent the floor and an upper position wherein said ends of said portions are positioned adjacent the work surface.

4,533,109

ELASTIC SUPPORT UNIT

Heinz Delam, Berlin, Fed. Rep. of Germany, assignor to Gerb Gesellschaft für Isolierung MBH & Co KG, Berlin, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,873
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 3040181
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—542 **15 Claims**



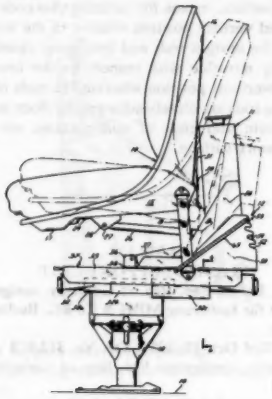
1. An elastic support unit, comprising a supporting element movable over a total path and including a rigid member connectable to an object, an elastic member which is elastic in a horizontal direction and in a vertical direction, and a sliding member located substantially between said elastic member and said rigid member and sliding over a sliding path dimensioned so that it starts to act upon exceeding the permissible elastic deformation of said elastic member said members being arranged so that first said elastic member deflects under the action of a horizontal force elastically horizontally until normally permissible stress in said elastic member so as to form a first elastic region, then after a horizontal restoring force of said elastic member exceeds a horizontal friction force between said sliding member and said rigid member said rigid member moves in a horizontal direction over the sliding path so as to form a second sliding region, and thereafter after exceeding said sliding path said elastic member is further elastically deformed by said rigid member with use of stress reserves between the permissible stress and a stress at the elasticity limit of said elastic element so as to form a third elastic region with the same elasticity as in said first elastic region and in said second sliding region, and then it is deformed plastically from a tensile limit stress to a breaking stress.

4,533,110

RESILIENTLY SUSPENDED, TILTABLE AND TETHERED VEHICLE OPERATOR'S SEAT HAVING FORE AND AFT ADJUSTMENT

Kevin E. Hill, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Sep. 26, 1983, Ser. No. 535,728
Int. Cl.³ B60N 1/02
U.S. Cl. 248—573 **1 Claim**



1. A resiliently suspended, tiltable and tethered vehicle operator's seat assembly for an earth-working vehicle such as a backhoe wherein an earth-working bucket or the like is operative to form an excavation in the ground and at the rear end of the vehicle and the operator is positioned on a vehicle seat located adjacent said rear end of said vehicle whereby the operator must visually observe the excavation being done, said seat assembly comprising: a seat assembly supporting pedestal secured to said vehicle adjacent one end thereof, said pedestal having a pair of laterally spaced seat assembly guide tubes, a slidable sub-frame slidably mounted on said guide tubes, a seat support frame supporting an operator's seat and also supporting resilient means for supporting said seat on said seat support frame, pivot means for pivotally connecting said support frame about a transverse horizontal axis to said sub-frame to permit said seat support frame, said seat and said resilient support means to tilt as a unit about said axis; and tether belt means connected between said seat and said slidable sub-frame for limiting the tilting movement of said seat support frame, said seat and said resilient means regardless of the position of the slidable sub-frame relative to said pedestal, safety stop means located between said pedestal and said slidable sub-frame to limit relative movement therebetween when said tether belt means is tensioned excessively, said safety stop means including flat steel bar stops welded along the side of said guide tubes, and also includes upwardly facing hooks welded to said slidable sub-frame, said hooks engaging said bar stops when said tether belt means is tensioned excessively.

4,533,111

CONSTRUCTION SYSTEM FOR CAST-IN-PLACE CONCRETE BARRIERS FOR ROADWAYS

Charles M. Cousin, 3909 Ames Blvd., Marrero, La. 70072, and Frederick H. Gondrella, Sr., Rte. 1, Box 451F, Belle Chasse, La. 70037

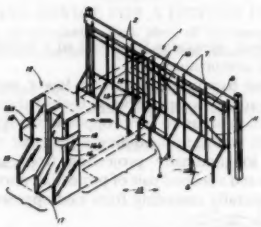
Filed Sep. 30, 1982, Ser. No. 428,528
Int. Cl.³ E01C 7/00
U.S. Cl. 249—2 **6 Claims**

1. A system for constructing concrete barriers with spacing between sections of the barrier for proper drainage for the roadway and for expansion during changing atmospheric conditions, including the step of inserting a collapsable and removable core into the framework of the barrier at gaps in the framework left for this purpose before the pouring of the concrete which makes up the outer surface of the barrier; said framework and core comprising:

(a) a framework of rods or studs mounted in or on the surface on which the concrete barrier is to be built with pins positioned on the framework parallel to the ground at predetermined gaps in the framework, which pins stick into said gap a predetermined, set distance from either side of the framework on either side of the gap; and

(b) a vertically disposed, collapsable core, movable as a rigid unit prior to insertion in the gap, mounted snugly against and between the pins on either side of the barrier in the general shape of the frame, said collapsable core being at least in part supported by said pins, which collapsable core comprises

(i) a first, vertically disposed, extended, rigid sheet of material forming an outer surface facing the direction from which the concrete is to be poured, which surface fits snugly against said pins extending into the gap from the side of the framework from which the concrete is to be poured, said first surface being constructed of a



material, such as plywood or steel, with enough strength to withstand the pressure of the concrete being poured without breaking or deforming;

(ii) a second, extended, rigid sheet of material forming an outer surface at least generally parallel to said first outer surface, facing away from the direction from which the concrete is being poured and located on the side of the collapsable core opposite said first outer surface, the outer surface of which fits snugly against the pins mounted on the side of the gap of the framework opposite the direction of the pouring of concrete; and

(iii) at least one, vertically disposed, inner core member, the inner core member(s) extending at least about the full peripheral areas of said first and second surfaces, which inner core member(s) fit snugly against each other and against said first and said second outer surfaces about at least most of their extended, vertically disposed surfaces, the number and width of said inner core member(s) corresponding to the predetermined spacing desired between sections of the barrier, said first and said second outer surfaces with said core member(s) sandwiched between them forming a solid, rigid unit which can be moved about as a unit before being placed between said pins.

4,533,112

CURB STAKE WITH INTEGRAL SUPPORT

Theodore J. Santos, Jr., and Gordon E. Pearlman, both of Los Angeles, Calif., assignors to Western Steel Cutting, Inc., Los Angeles, Calif.

Filed Oct. 11, 1983, Ser. No. 540,519
Int. Cl.³ E01C 19/50
U.S. Cl. 249—3 **8 Claims**

4. Concrete form apparatus for use in forming a concrete pad having a substantially vertical sidewall, comprising:

an elongated form disposed generally on or near the ground, the form having an inward side and an outward side and adapted to receive concrete adjacent to its inward side;

a plurality of curb stakes disposed adjacent to the outward side of the elongated form, each curb stake including

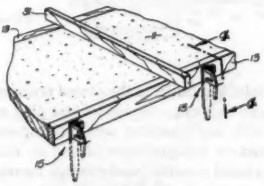
an elongated shaft having a lower end and an upper end, the lower end having a pointed tip to facilitate its being driven into the ground immediately adjacent to the form, and

support means integral with the shaft and disposed on the side of the shaft opposite the form, for engaging the ground when the shaft has been driven into the ground a predetermined distance; and

attachment means for securing the elongated form to each of the curb stakes;

wherein the support means of each curb stake prevents the shaft from pivoting in a direction away from the form, whereby the curb stake resists both outward displacement and outward pivoting of the form when concrete is poured on its inward side;

and wherein the support means of each curb stake includes first means defining a support surface secured to the



stake's elongated shaft, the support surface being oriented substantially perpendicular to the axis of the shaft and abutting the ground when the shaft is driven the predetermined distance into the ground,

second means defining an impact surface secured to the stake's elongated shaft at or near its upper end, the impact surface being oriented substantially perpendicular to the axis of the shaft and configured to be struck by a blunt instrument, to drive the lower end of the shaft into the ground, and

a second elongated shaft secured to the ends of the first and second means opposite the stake's first elongated shaft, the second elongated shaft including a spike projecting below the first means and in substantially the same direction as the lower end of the first elongated shaft, the spike including a pointed tip to facilitate its being driven into the ground along with the lower end of the first elongated shaft,

wherein the first means, second means, and second elongated shaft cooperate to form an opening therebetween sized to permit insertion of an elongated tool, for use in extracting the stake from the ground.

4,533,113

COMPACT HIGH TORQUE ROTARY VALVE OPERATOR FOR SIMULTANEOUS ACTUATION OF MULTIPLE ROTARY VALVES

Armand Francart, Jr., Rte. #2, Landenberg, Pa. 19350

Filed Apr. 24, 1984, Ser. No. 603,378

Int. Cl.[3] **F16K** *31/163*

U.S. Cl. 251—63.4 **4 Claims**

1. A valve operator for operating at least one rotary valve, said valve operator comprising:

a valve operator housing including a housing wall,

a rod means capable of movement in the direction of its axis,

motor means mounted on said valve operator housing and operatively coupled to said rod means for axially reciprocating said rod means,

said at least one rotary valve having a valve housing for mounting to said valve operator housing,

said at least one rotary valve including a rotary valve stem mounted within said valve housing and being fixedly coupled to a rotatable valve element for rotation of said valve element between valve open and valve closed positions, and

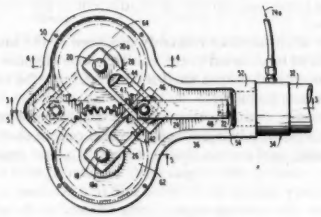
wherein said valve operator further comprises means within said valve operator housing for operatively connecting said rod means to said valve stem and for changing the reciprocating motion of said rod means to rotary movement of said valve stem,

the improvement wherein said connecting and motion changing means comprises:

first and second parallel shafts mounted within said valve operator housing wall for rotation about their axes at right angles to the axes of said rod means and positioned respectively to opposite sides of said rod means,

said first and second parallel shafts each include at least one means for connecting one of said shafts to said rotary valve stem of said at least one valve element,

arms fixed to respective shafts and projecting radially therefrom at different vertical heights, said arms having first and second ends wherein the first end of each arm is fixed to a respective shaft



longitudinal slots within said arms,

pin means fixed to said rod means and projecting right angles to the axis of said rod means and engaged commonly within said slots,

a pair of equal diameter gears coaxially fixed respectively to said shafts at a common level, rotatable therewith, and being intermeshed with each other,

and wherein each of said shafts is positioned an equal distance from the axis of said rod means and in opposite sides of the axis of said rod means, said arms are of such length as to sweep across said rod means during rotation thereof such that said second ends of said arms overlap, wherein the length of said longitudinal slots and the positions of the same within said arms and wherein the extent of reciprocation of said rod means is such that during rod means reciprocation, said valve element is rotated from full open position to full closed position and vice versa;

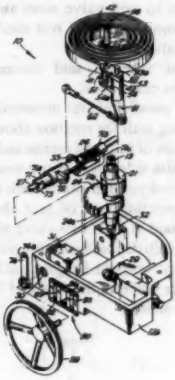
whereby, said shafts rotate in unison, forces are evenly distributed from the motor means to said shafts, there is no side thrust acting on said rod by reaction torque from said at least one rotary valve, power losses are minimized, and breakout forces acting on the valve element are maximized.

4,533,114

FAIL-SAFE ACTUATOR FOR ROTARY VALVES

John M. Cory, Old Lyme; Edward W. Varney, Centerbrook, both of Conn.; Jon A. Babcock, Westerly, R.I., and Andrew Pupillo, Pawcatuck, Conn., assignors to Posi-Seal International, Inc., North Stonington, Conn.

Filed Feb. 8, 1983, Ser. No. 465,028
Int. Cl.³ F16K *31/44*
U.S. Cl. 251—67 **26 Claims**



1. An actuator for a rotary valve having a rotatable closure member comprising:

a housing mountable on the valve adjacent to the valve closure member;

an output shaft member rotatably mounted in the housing and adapted to be coupled to the valve closure member such that rotation of said output shaft member effects the rotation of said closure member;

unitary biasing means having first and second end portions, the first end portion being coupled to said output shaft member for biasing said output shaft member to a first position;

means for rotating said output shaft member against the bias of said unitary biasing means from said first position to a second position, said rotating means being adapted to fix said output shaft member in said second position;

clutch means associated with said rotating means for selectively coupling said rotating means with said output shaft member, said clutch means having a first position which effects the uncoupling of said rotating means from said output shaft member and a second position which effects the coupling of said rotating means with said output shaft member said clutch means being coupled to said second end portion of said biasing means for biasing said clutch means to its first position;

clutch fixing means for selectively fixing said clutch means in its second position, against the bias of said unitary biasing means; and

release means associated with said clutch fixing means for selectively releasing said clutch fixing means such that said unitary biasing means can return said clutch means to its first position, thus uncoupling said rotating means from said output shaft member and also permitting said unitary biasing means to return said output shaft member to its first position.

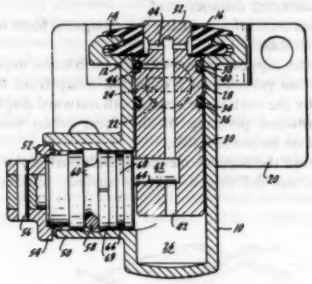
4,533,115

GLADHAND WITH DIRT PROTECTION PLUG

Frederic Lissau, Chicago, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Apr. 6, 1983, Ser. No. 482,502
Int. Cl.³ F16L *37/28*
U.S. Cl. 251—142 **3 Claims**

1. A combination gladhand and dirt protection plug for use in gladhand coupling applications including a gladhand body having an air inlet and an air outlet, a seal member positioned to said air outlet, a chamber in said body connecting said inlet and outlet, a dirt protection plug in said chamber and an exterior handle for moving it between positions opening and closing communication between said inlet and outlet, said dirt protection plug carrying a nose portion which penetrates said outlet seal in the closed position and is in peripheral contact therewith to prevent dirt and other foreign matter from entering said chamber, closing seal means to close communication



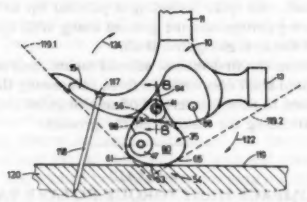
between said inlet and outlet in the closed position of said plug including spaced seal rings carried by said plug and in sealing engagement with said chamber wall, said spaced seal rings being positioned on opposite sides of said air inlet when said plug is in the closed position, vent passage means in said plug connecting opposite ends thereof to relieve pressure upon said plug during movement thereof, said vent passage means extending to an area behind said one of said seal rings closest to said nose and the exterior of said dirt protection plug to relieve back pressure thereupon.

4,533,116

CLAW HAMMER FOR DRIVING AND EXTRACTING NAILS

Vlatko Panovic, Vancouver, Canada, assignor to Drexore Resources Inc., Vancouver, Canada

Filed Jul. 5, 1983, Ser. No. 510,624
Int. Cl.³ B66F *15/00*
U.S. Cl. 254—26 R **15 Claims**



1. A hammer head adapted to be fixed to a hammer shaft, the head having a face at one end for striking a nail for driving the nail into a work surface, and a claw device at an opposite end for extracting the nail from the work surface, the head being characterized by:

(a) a fulcrum member having an inner portion hinged to the head by a hinge assembly for rotation between extended and retracted positions, the hinge assembly having a hinge axis disposed normally to the hammer shaft and normally to a head axis extending between ends of the hammer head,

(b) load relieving means characterized by the fulcrum member having a fulcrum member bearing surface and the hammer head having a head bearing surface, the two bearing surfaces being adapted to contact each other when the fulcrum member is in the extended position, so that a contact area between the bearing surfaces is disposed between the hinge pin and an outer periphery of the fulcrum member which is in contact with the work surface, so as to transfer load between the bearing surfaces, and to relieve load from the hinge assembly when extracting nails,

(c) the head having a recess to receive the fulcrum member in the retracted position,

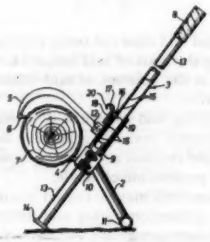
(d) retaining means cooperating with the fulcrum member and the hammer head to retain the fulcrum member in the retracted position while hammering.

4,533,117

LIFTING DEVICE

Per-Eric Schwang, Dannemansvägen 36, S-181 41 Lidingö, Sweden

Filed Feb. 8, 1983, Ser. No. 464,811
Claims priority, application Sweden, Feb. 11, 1982, 8200725
Int. Cl.³ B66F *7/22*
U.S. Cl. 254—94 **2 Claims**



1. A device for lifting objects from the ground, comprising:

a substantially L-shaped lever having a shorter leg and a longer leg, the end of the shorter leg forming a ground support and constituting a fulcrum for the longer leg;

engagement means being swingably connected to the longer leg so as to engage an object to be lifted upon actuation of the longer leg;

support means extensible in the direction of the longer leg for holding the object in the raised position;

said longer leg and said adjustable connecting means each including at least one bore through respective surfaces thereof;

pin means selectively insertable into said bores for interlocking said longer leg and said adjustable connecting means; and,

said adjustable connecting means including both swinging and stationary engagement means to engage an object to be lifted.

4,533,118

STRIPPER ASSEMBLY FOR REMOVING CARPET

Philip D. Thomas, and Harvel W. Thomas, both of 10471 SW. 40 Ter., both of Miami, Fla. 33165

Filed Jun. 17, 1983, Ser. No. 505,298
Int. Cl.³ B66D *1/00*; B32B *1/00*
U.S. Cl. 254—202 **14 Claims**

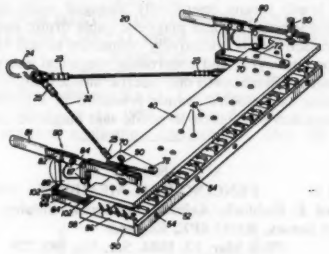
1. A stripper assembly primarily designed to remove carpeting of the type directly adhered to a floor or like surface, said stripper assembly comprising:

(a) gripping means structured for secure attachment to a portion of a carpet being stripped and comprising a jaw assembly including a first jaw element and a second jaw element cooperatively positioned to engage a carpet portion therebetween in secured relation to said gripping mens,

(b) driving means connected in substantially driving relation to said gripping means and structured to displace said gripping means and secured carpet portion upon activation of said driving means,

(c) anchor means connected to said driving means and structured for secured positioning of said driving means in a spaced location relative to said gripping means and secured carpet portion,

(d) said jaw assembly interconnected to said driving means to move with said second carpet portion towards said



driving means upon activation thereof and further comprising grasping means mounted between said first and said second jaw elements and structured to securely engage a carpet portion therebetween,

(e) said grasping means comprising a plurality of teeth disposed to extend upwardly from an inner surface of at least one jaw element, said teeth configured to penetrate the secured carpet portion between said jaw elements, and

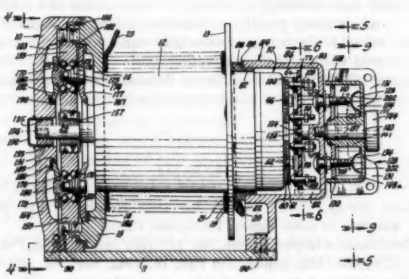
(f) said grasping means further comprising a plurality of positioning blocks disposed and configured to force the secured carpet portion into abutting engagement with the plurality of teeth so as to be penetrated thereby.

4,533,119

WINCH ASSEMBLY

Howard G. Liverance, 13149 Sycamore, Southgate, Mich. 48195, and Jack E. Wood, 7644 Plymouth, Ann Arbor, Mich. 48105

Filed Jan. 9, 1980, Ser. No. 110,620
Int. Cl.³ B66D *1/12, 1/22, 3/20, 3/26*
U.S. Cl. 254—344 **12 Claims**



1. A power winch mechanism comprising:

(a) a rotatable magnetic cable drum;

(b) an electric motor including an armature and a permanent magnet field integral with said magnetic cable drum to

combine with said magnetic cable drum to form a complete magnetic circuit:

(c) a base plate;

(d) means for rotatably mounting one end of said magnetic cable drum on said base plate;

(e) means carried by said magnetic cable drum for rotatably mounting one end of said electric motor armature;

(f) a gear housing mounted on said base plate and rotatably supporting the other end of said magnetic cable drum and the other end of said electric motor armature;

(g) a planetary gear type reduction unit operatively mounted in said gear housing and drivably connecting said other end of said electric motor armature to said other end of said magnetic cable drum with diametrically opposed, substantially co-planar, and equal driving forces;

(h) brush means operatively engaged with said electric motor armature and magnetic cable drum; and,

(i) switch means operatively connected to said brush means for conveying and controlling electrical energy through said brush means to said electric motor armature for operating said electric motor armature in a pre-determined direction of rotation to rotate said magnetic cable drum.

4,533,120

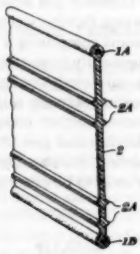
FENCING RAIL MEMBERS

Bernard J. Ruddock, Animart, Ashbrook, Shipley, Horsham, West Sussex, RH13 8PE, England

Filed Mar. 12, 1984, Ser. No. 588,729

Int. Cl.³ B21F *27/00*

U.S. Cl. 256—52 **6 Claims**



1. A fencing rail member comprising

a plurality of longitudinally extending wires,

a web of synthetic resin material covering and extending between said wires and maintaining said wires in spaced, parallel relationship,

said web having a transverse width at least ten times its thickness,

said web including a plurality of longitudinal ribs extending substantially parallel with said wires, the thickness of each of said ribs being substantially equal to the thickness of said wires and their covering, and

said ribs being offset different distances from the longitudinal center line of said web so as to interlock when the web is rolled.

4,533,121

VARIABLE PITCH STAIR RAILING ASSEMBLY

Gene Basey, 18447 Santar, Rowland Heights, Calif. 91748, assignor to Gene Basey, LaPuente, Calif.

Continuation-in-part of Ser. No. 157,186, Jun. 6, 1980, Pat. No. 4,352,485. This application Feb. 16, 1982, Ser. No. 348,970

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ E04H *17/14*

U.S. Cl. 256—67 **20 Claims**

1. A stair rail assembly which may be varied in its mounting angle from a neutral orientation of approximately 36 degrees by a predetermined angle up to about 10 degrees in either direction comprising:

a wooden handrail,

a wooden shoe rail,

wooden balusters extending between said handrail and said shoe rail,

means, including a pin extending into each end surface of each said baluster and into said shoe and handrails, for securing said balusters to said shoe and handrails, said pins having their longitudinal axis extending generally parallel to a vertical plane and to the plane of the overall stair rail assembly;

said pins being of high strength, having a very low elastic limit, and being permanently deformed when bent;

said handrail and said shoe rail being provided with recesses for receiving the ends of said balusters, and having additional holes at the bottoms of said recesses for receiving said pins; and

means for mounting said ends of said balusters in said recesses with clearance permitting angular movement of said balusters in said recesses and relative to said hand and shoe rails by said predetermined angle;

whereby said assembly may be racked to a different mechanically stable inclination within said predetermined angle, with said balusters remaining vertical, with said pins holding their new orientation, and with said recesses substantially concealing the small angular displacement of the ends of said balusters relative to said rails.

4,533,122

BARRIER SYSTEM

Brian C. Bannister, North Mymms, England, assignor to Marler Haley Exposystems Ltd., Hertfordshire, England

Filed Jun. 7, 1982, Ser. No. 386,038

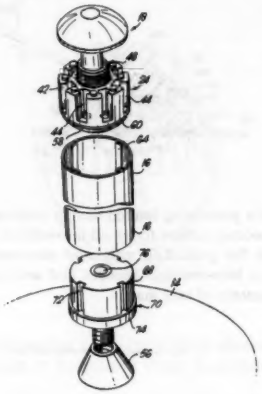
Claims priority, application United Kingdom, Jun. 10, 1981, 8117820

Int. Cl.³ E04F *11/18*

U.S. Cl. 256—69 **8 Claims**

1. An upright for a barrier system of the type comprising a plurality of uprights connected by rails, ropes or the like, the upright comprising a base, a column upstanding therefrom, a head member mounted on the column, the head member including a first part and a second part, means securing said first part to the column, said first part affording a plurality of peripheral slots each extending longitudinally and opening also onto one axial end face of the first part, said slots opening onto the periphery of said first part via respective restricted throat portions, whereby radial withdrawal of fitments of complementary form from said slots can be prevented, the first part including a central portion, said second part of the head member further comprising a cap having a central portion, a peripheral skirt spaced outwardly from said central portion of the cap and providing an end face opposing said end face of the first part, and capable of mating engagement with said end face of the first part to close off the axial ends of said slots, the central portion of the cap and the central portion of the first part having inter-engaging screw threads thereon about a longitudinal axis of the head member whereby the cap can be screwed

down into the first part, to engage, by said end face of said skirt, said end face of the first part, by rotation of the cap, relative to the slotted member, about said axis or can be unscrewed to move said end face of the cap skirt away from said end face of the slotted member to space said end faces from one another and allow insertion or removal of fitments into or from said slots, said head member having a passage extending there-



through along said longitudinal axis, through the slotted member and the cap member, an internal clutch within said passage including a collet carried by one of said part of the head member and means for contracting said collet carried by the other of said parts of the head member, whereby said collet contracting means can be operated to contract the collet by screwing said cap down onto the slotted member.

4,533,123

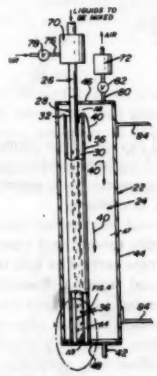
LIQUID MIXING DEVICE

Richard P. O'Leary, Wayne, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed May 7, 1984, Ser. No. 607,494

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—61 **18 Claims**



1. Apparatus for mixing at least two fluids to produce a homogenous mixture, said apparatus having an inlet adapted for receipt of at least two fluids, a hollow receiving chamber having an outlet, an elongated hollow cylindrical member defining a cavity therein and being located within said chamber, said member being closed at one end thereof and having an opening adjacent the other end thereof, said opening being in fluid communication with said chamber, and an elongated conduit located within said cavity and coupled to said inlet for receipt of said two fluids, said conduit including plural, longitudinally spaced stream producing means for producing at least two longitudinally spaced streams of fluid, with each stream being directed into said cavity in a respective direction to produce a respective eddy current therein, and with immediately adjacent eddy currents flowing in opposite rotational directions to to effect a mixing action of said fluids, whereupon said mixed fluid flows out of said opening in said member and into said receiving chamber for egress from said apparatus via said outlet.

4,533,124

DEVICE FOR DELIVERING GASEOUS AND SOLID MATERIALS TO A METAL POOL DURING A REFINING PROCESS

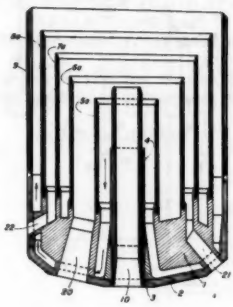
Robert Mercatoris, Eich, Luxembourg, assignor to MecanARBED-Dommeldange S.a.r.l., Luxembourg

Filed Oct. 17, 1983, Ser. No. 542,429

Claims priority, application Luxembourg, Oct. 22, 1982, 84433

Int. Cl.³ C21C *5/32*

U.S. Cl. 266—225 **15 Claims**



1. A blowing apparatus for simultaneously delivering gaseous and solid materials to a hot melt, the apparatus comprising:

a block, said block having an axis;

a plurality of annular elements in said block concentric with respect to said axis of said block, said annular elements forming the boundary walls for a plurality of corresponding concentric chambers therebetween;

at least one of said chambers forming a central longitudinal passage;

at least one nozzle in said block communicating with at least one other of said chambers;

a block sheath cooperating with and separable from said block, said block sheath including a substantially cylindrical side wall portion and forming a housing for said block;

a central opening in said block sheath communicating with said central longitudinal passage;

means for spacing said block and said block sheath;

at least one opening in said block sheath corresponding to each of said nozzles, each said nozzle communicating with its corresponding opening in said block sheath;

said spacing means acting to space said block from said block sheath, thereby forming body passage means for fluid to flow therethrough between said block and said block sheath;

a plurality of concentric tubes, each of said tubes corresponding to and being connected with one of said annular elements, at least one pair of adjacent concentric tubes cooperating to define a gas supply passage in flow communication with said one nozzle; and

a central longitudinal tube connected to said central opening in said block for the delivery of solid material therethrough, said central tube being within said plurality of concentric tubes, and said central tube and the innermost of said concentric tubes cooperating to define a fluid flow passage connected to and communicating with said body passage means.

4,533,125

APPARATUS FOR GUIDING AND CHANGING IMMERSION LANCES

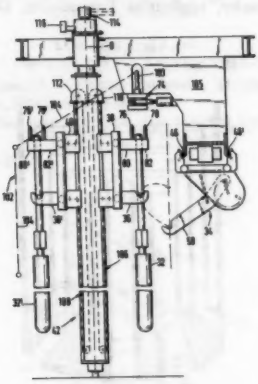
Pierre Mailliet, Howald; Radomir Andonov, Mamer; Hubert Stomp, Howald, and Jean Monai, Petange, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Dec. 20, 1983, Ser. No. 563,630

Claims priority, application Luxembourg, Dec. 21, 1982, 84543; Jun. 29, 1983, 84884

Int. Cl.³ C21C *5/30*

U.S. Cl. 266—226 **37 Claims**



1. Apparatus for guiding and changing lances for use with a metal melt comprising:

mounting means for mounting a plurality of lances, said mounting means having a vertical axis and being capable of rotating about said vertical axis;

at least two lance carriage means mounted on and vertically movable along said mounting means, each of said lance carriage means being capable of supporting a lance;

gas supply head means for providing flow communication between a supply system and the upper part of a lance supported in at least one of said lance carriage means;

lance storage means for storing lances at a location spaced from said mounting means; and

lance transfer means for transferring lances between said lance storage means and said lance carriage means.

4,533,126

THREE PIECE SNUBBER FOR AUTOMATIC WASHER

Dale E. Mueller, Benton Township, Berrien County, and Joel M. Snider, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 3, 1982, Ser. No. 446,782

Int. Cl.³ D06F *23/00;* **B60T** *7/12*

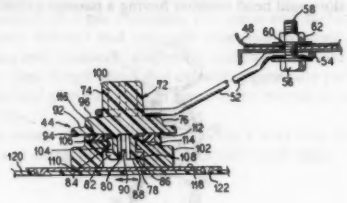
U.S. Cl. 267—141 **12 Claims**

1. In an automatic washer having a suspension system including a suspended mass susceptible to excursion, a dual friction snubber system comprising:

a snubber having first and second parallel uniplanar friction surfaces, said first surface providing high friction and said second surface providing low friction;

a support on said suspended mass against which said snubber first surface acts;

a spring means for holding said snubber against said support; and



means for permitting limited sliding uniplanar movement at said second surface for small movements of said mass and means for providing uniplanar movement at said first surface between said snubber and said support for large movements of said mass.

4,533,127

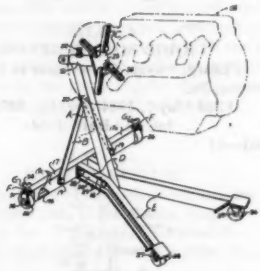
WHEELED STAND

Joel W. Hawkins, Box 3867, Greenville, S.C. 29608

Filed Oct. 6, 1983, Ser. No. 539,755

Int. Cl.³ B66F *3/00*

U.S. Cl. 269—17 **3 Claims**



1. An engine stand having a base formed from a transverse base member, and a longitudinal base portion extending forwardly from said transverse base member; said base being supported by wheels, comprising:

a post carried by said longitudinal base portion and being inclined rearwardly toward said transverse base portion;

a pair of upright straps carried by said transverse base member on one end and tapering inwardly toward and being removably connected to said post on the other end;

engine mounting means carried adjacent an upper end of said post extending outwardly above and in alignment with said longitudinal base portion;

said longitudinal base portion including

a pair of structural members each having a first section extending removably outwardly from said transverse base member in general longitudinal alignment;

a second section diverging outwardly from each of said first sections; and

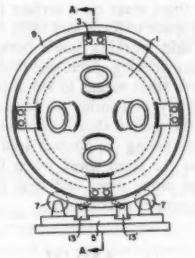
fastening means removably securing said post between said first sections remote from said transverse base member.

4,533,128

DEVICE FOR SUPPORTING AND ROTATING A PART OF LARGE DIMENSIONS

Jean-Paul Guigon, Givry, France, assignor to Framatome & Cie, Courbevoie, France

Filed Jul. 12, 1983, Ser. No. 513,203
Claims priority, application France, Jul. 20, 1982, 82 12613
Int. Cl.³ B23K *37/04*
U.S. Cl. 269—58 **4 Claims**



1. Device for supporting a part (1) of large dimensions, and permitting said part to be rotated about its horizontal axis, comprising

(a) a frame (5) carrying a plurality of pairs of rollers (6, 7) having horizontal axes, at least one of said pairs (6) consisting of driving rollers;

(b) a cylindrical support (4) provided with means (3) for fastening said part (1) in its interior and adapted to be positioned on said rollers (6, 7) in such manner as to be driven in a rotational movement about its horizontal axis when said driving rollers (6) are themselves given a rotational movement;

(c) means (13, 13') for stopping rotational movement of said driving rollers (6) in the event of incorrect positioning of said support (4) on said frame (5), said stopping means (13, 13') comprising at least one pair of rocking contactors (13, 13') disposed on said frame (5), and against which said support (4) abuts when it is correctly positioned on said frame (5); and

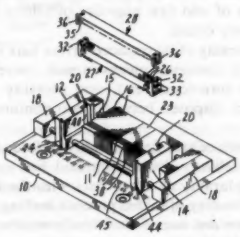
(d) means (14, 14', 9) for locking said support (4) against axial translation relative to said frame (5).

4,533,129

ELECTRICAL CONNECTOR LOCATOR PLATE

Jerome A. Malmquist, Shoreview, and Dean K. Reidt, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 9, 1984, Ser. No. 569,276
Int. Cl.³ H01R *43/04*; B25B *1/02*
U.S. Cl. 269—207 **11 Claims**



1. A locator plate for positioning a plurality of different length multi-contact insulation displacement connectors for connection to multi-conductor flat cables, comprising:

a base plate,

an end guide support rod mounted parallel to said base plate,

a pair of connector end guides having facing connector end guide channels that extend perpendicular to said base plate, at least one of said end guides being slidable along said end guide support rod toward and away from the other end guide to change the spacing between said end guide channels,

a shim support rod mounted parallel to and spaced from said end guide support rod,

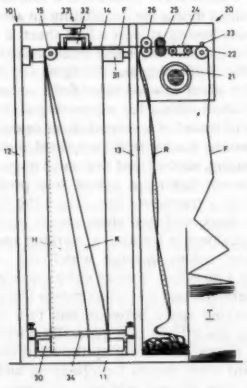
a plurality of shims having parallel major faces mounted on said shim support rod with their major faces perpendicular to the axis of said support rod and being slidable along said shim support rod, said shims extending from said shim support rod a sufficient distance to extend into the space between said connector end guides to define the spacing between said end guides and being individually pivotable on said shim support rod out of the space between said connector end guides to permit said movable end guide to be slid closer to the other end guide.

4,533,130

APPARATUS FOR FOLDING A RUNNING WEB WITH FOLDING ROLLER AND ADJUSTABLE PARALLELLING BAR

Walter Suter, Ringlikerstrasse 39, CH-8142 Uitikon, Switzerland

Filed Sep. 24, 1984, Ser. No. 653,856
Claims priority, application Switzerland, Sep. 28, 1983, 5264/83
Int. Cl.³ B41L *43/04*
U.S. Cl. 270—41 **6 Claims**



1. An apparatus for folding a running web having a direction of advance through the apparatus; comprising

(a) a deflecting roller supporting the running web; said deflecting roller having a longitudinal axis;

(b) scoring means for providing a weakening score line in said running web parallel to the running direction thereof for dividing the web into side-by-side arranged first and second web portions;

(c) a folding roller supporting said running web; said folding roller being situated spaced from and downstream of said deflecting roller as viewed in said direction of advance; said folding roller having a longitudinal axis oriented at least approximately at right angles to the longitudinal axis of said deflecting roller, whereby said running web undergoes an approximately 90° twist and said first web portion of the running web folds over said second web portion

along said score line as the running web passes from said deflecting roller onto said folding roller;

(d) a parallelling bar arranged in the immediate vicinity of said folding roller and cooperating therewith for pressing the running web thereagainst; and

(e) adjusting means for arbitrarily varying the relative position between said folding roller and said parallelling bar for setting a desired wind round angle variation of said web about said folding roller along the longitudinal axis thereof.

4,533,131

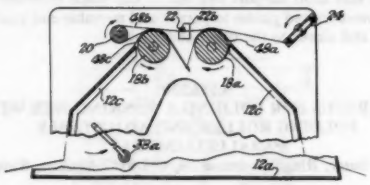
PORTABLE DECOLLATING MACHINE

James E. Burns, 4221 NE 25th Ave., Lighthouse Point, Fla. 33308

Continuation of Ser. No. 88,596, Dec. 26, 1979, abandoned. This application Nov. 9, 1981, Ser. No. 319,747

Int. Cl.³ B65H *41/00*

U.S. Cl. 270—52.5 **5 Claims**



1. A desk top deleaver for decollating an assembly of continuous forms including a plurality of continuous sheets into separate stacks comprising:

a housing including four sheet means for guiding the continuous forms, said four sheet means including two sheet means, a third sheet means and a fourth sheet means,

said two sheet means for decollating an assembly of continuous forms having at least a first sheet, a second sheet and a third sheet, said two sheet means comprising a first sheet means for supporting and changing the direction of travel of a first sheet toward one of the separate stacks and a second sheet means for supporting and changing the direction of travel of a second sheet toward another one of the separate stacks, said two sheet means connected to said housing, each of said first sheet means and said second sheet means having a center line positioned generally parallel to a transverse line across the first sheet and the second sheet, said two sheet means positioned in spaced apart relationship forming a working space between said two sheet means through which the continuous forms move in a direction from an entrance side of said working space between said two sheet means toward an exit side of said working space between said two sheet means, said working space lying in a generally horizontal plane,

a take-up means, for taking up the third sheet,

said third sheet means for changing and redirecting the third sheet toward said take-up means, said third sheet means having a center line generally parallel to said center lines of said two sheet means and connected to said housing and positioned adjacent said first sheet means and positioned near said working space with said working space generally between said third sheet means and said second sheet means,

said take-up means connected to said housing and positioned adjacent said second sheet means and positioned near said working space with said working space generally between said take-up means and said first sheet means, said take-up means constructed and arranged to pull the third sheet through said working space with the aid of said fourth sheet means,

said third sheet means and said take-up means connected to said housing and connected and arranged to position the third sheet with the aid of said fourth sheet means to frictionally engage the second sheet of the continuous forms after decollating to aid in properly separating the assembly of continuous forms moving through said working space,

said fourth sheet means having a center line generally parallel to said center lines of said two sheet means and connected to said housing, and said fourth sheet means positioned and arranged to engage the third sheet after the third sheet has been redirected by said third sheet means in a location between said third sheet means and said second sheet means, said fourth sheet means engaging said third sheet on a surface thereof opposite said working space to force said third sheet to track along a path in said working space between said two sheet means said working space, said third sheet positioned by said fourth sheet means to aid in proper decollating of the assembly of continuous forms by contacting and moving the second sheet over said second sheet means and by increasing the contact area between the second sheet and the third sheet when the second sheet attempts to move over said first sheet means thereby aiding in proper decollating.

4,533,132

COLLATING MACHINE

Jochen Wangermann, Appen, Fed. Rep. of Germany, assignor to Gruner & Jahr Ag & Co., Itzehoe, Fed. Rep. of Germany

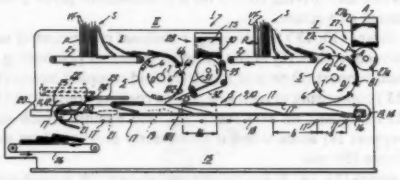
Continuation of Ser. No. 847,895, Nov. 2, 1977, Pat. No. 4,200,275. This application Jan. 7, 1980, Ser. No. 110,097

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2631058

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.³ B42B *2/00*

U.S. Cl. 270—53 **3 Claims**



1. A process for collating a plurality of folded sheet products into a complete product, each of said plurality of folded product being folded along a fold into a least two folded portions, said process comprising the steps of:

conveying a first plurality of folded product from a first storage means to a first orientation unit on a first conveying means;

orienting said first plurality of folded product in said first orientation unit with the fold of each of said first plurality of folded product being in a first predetermined direction perpendicular to said conveying direction;

feeding each of said first plurality of folded product into a first delivery drum;

moving a plurality of interspaced driver bars and holder bars of said first conveyor means in said conveying direction towards a turn-round end, said plurality of driver and holder bars disposed between two continuous drive elements;

delivering each of said first plurality of folded product with said first delivery drum from said first orientation unit onto said plurality of driver bars with the fold of each of said first plurality of folded product leading in the conveying direction and one of the folded portions of each of said plurality of folded product supported by one of said driver bars and one of said holder bars;

conveying at least one additional plurality of folded product

from at least one additional storage means to at least one additional orientation unit;

orienting said at least one additional plurality of folded product in said at least one additional orientation unit with the fold of each of said at least one additional plurality of folded product being in said first predetermined direction perpendicular to said conveying direction;

feeding each of said at least one additional plurality of folded product onto at least one additional delivery drum located down stream of said first delivery drum in said conveying direction;

delivering each of said at least one additional plurality of folded product with said at least one additional delivery drum from said at least one additional orientation unit onto said plurality of driver bars in timed relationship to said first delivery drum, each of said one additional plurality of folded product nested over one of said first plurality of folded product, previously delivered to said driver bar by said first delivery drum to form a nested product;

conveying said nested product with said first conveyor means from said first and at least one additional delivery drum to a stitching station having a first member disposed adjacent to the turn-round end of said first conveyor means and a second member juxtaposed said turn-round end of said first conveyor means, one of said first and second members being a stitching member and the other being a counterpiece;

translating said second member in a direction parallel to said conveying direction to pass between the folded portions of said nested product to press the fold of said nested first and at least one additional plurality of folded product between said first and second members after said driver bar has passed the first member of said stitching station; and

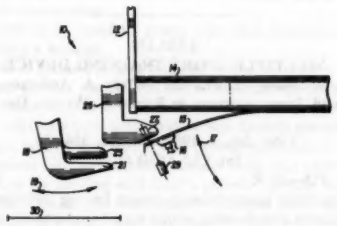
stitching the fold of said nested product to produce a completed product and depositing said completed product onto a second conveyor, said completed product maintaining the fold of said first and said at least one additional plurality of folded product perpendicular to said conveying direction.

4,533,133

METHOD AND APPARATUS FOR PREVENTING INSERTION ERRORS

Kenneth A. Hams, Easton, Pa., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Sep. 28, 1982, Ser. No. 425,220
Int. Cl.³ B65H 5/26
U.S. Cl. 271—9 **26 Claims**



1. An insertion machine having at least one supply station located alongside a transport means, said machine comprising:

supply means at said supply station containing at least one piece of material;

selector means for selecting at least a portion of said material as being subject to extraction from said supply means;

monitoring means for detecting the quantity of material selected from said supply means by said selector means, said monitoring means further comprising:

(1) transmitting means for directing an infrared signal toward said selected material;

(2) means for receiving said infrared signal; and,

(3) means for determining whether the magnitude of said received infrared signal is in an acceptable range; and,

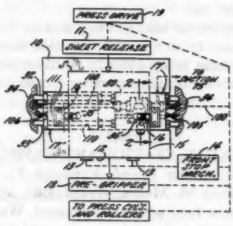
gripper means for extracting said selected material from said supply means and for depositing said extracted material on said transport means if said magnitude of said received infrared signal is in said acceptable range.

4,533,134

MECHANISM FOR THE LATERAL ALIGNMENT OF SHEETS IN A PRINTING MACHINE

Hans-Peter Galster, Seligenstadt, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 451,255, Dec. 20, 1982, abandoned. This application Feb. 16, 1983, Ser. No. 466,878
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150169
Int. Cl.³ B65H 9/16
U.S. Cl. 271—240 **9 Claims**



1. A device for registering a sheet at either one of the opposite lateral edges of a feed table in a printing press having a frame and a press drive and having means timed with the drive for releasing the sheets to the feed table for feeding one-by-one, the combination comprising a housing having a top surface flush with the feed table, first and second means for alternative mounting of a side stop at the respective lateral edges of the feed table, a suction head flushly recessed in the surface of the housing, means including a slide in the housing for mounting the suction head for limited reciprocating movement toward and away from the side stop mounting means, means mounting said housing for shifting between alternative working positions at the respective lateral edges of the feed table for the purpose of utilizing the suction head in the respective working positions for the selective alignment of a sheet at the respective lateral edges, first and second means carried by and shiftable with said housing between said respective working positions for alternatively driving of the suction head in its respective working positions, the alternative driving means being relatively out of phase by 180° to produce movement of the sheet into contact with the adjacent one of the side guides timed with the feeding of sheet on the feed table, and means for selecting the alternative driving means.

4,533,135

JAMMED SHEET REMOVAL AID IN A REPRODUCING MACHINE

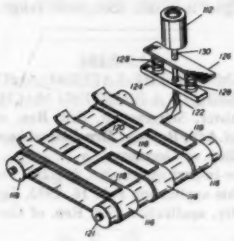
Laurence S. Barker, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 29, 1983, Ser. No. 518,585
Int. Cl.³ B65H 5/02
U.S. Cl. 271—275 **4 Claims**

3. A sheet transport, including:

means for accessing the interior of the sheet transport;

means, disposed interiorly of the transport, for advancing sheet-like material;
means for holding the material on said advancing means;
means, operatively coupled to said accessing means, for storing a supply of fluid therein, said storing means includes a storage bellows coupled to said accessing means so that closing of said accessing means compresses said



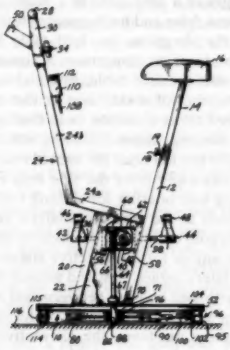
storage bellows forcing fluid therefrom and opening said accessing means expands said storage bellows drawing fluid therein; and
means, connected to said storing means, for moving said holding means to an operative position in response to said accessing means being closed and to an inoperative position in response to said accessing means being opened.

4,533,136

PEDAL-OPERATED, STATIONARY EXERCISE DEVICE

David B. Smith, Mercer Island; Randolph F. Miller, Mount Vernon, and John M. Moore, Woodinville, all of Wash., assignors to Precor Incorporated, Redmond, Wash.

Filed Oct. 9, 1984, Ser. No. 658,531
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—73 **7 Claims**



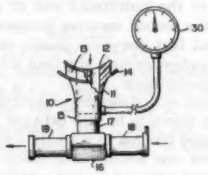
1. A stationary exercise apparatus comprising:
(a) a base;
(b) a flywheel rotatably mounted on said base for rotation about a first axis;
(c) first and second pedal cranks mounted on said base for rotation about a common second axis, said second axis substantially orthogonal to said first axis;
(d) drive means associated with said base drivingly coupling said pedal cranks to said flywheel, said drive means including:
a pedal shaft, said first and second pedal cranks fixed on, respectively, first and second ends of said pedal shaft;
a drive gear fixed to said pedal shaft for rotation in unison with said pedal shaft;
a driven gear drivingly engaged by said drive gear, said driven gear being directly coupled to said flywheel to drive said flywheel in response to rotation of said pedal cranks; and
wherein said drive gear is a worm gear and said driven gear is a worm;
(e) a flywheel shaft, said worm being formed in a first portion of said flywheel shaft; and,
(f) a clutch means associated with said flywheel and engaging a second portion of said flywheel shaft to drivingly couple said flywheel shaft to said flywheel.

4,533,137

PULMONARY TRAINING METHOD

Leonard J. Sonne, Boston, Mass., assignor to HealthScan Inc., Upper Montclair, N.J.

Continuation of Ser. No. 340,734, Jan. 19, 1982, abandoned, which is a continuation of Ser. No. 128,283, Mar. 7, 1980, abandoned. This application Mar. 13, 1984, Ser. No. 587,863
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—99 **1 Claim**



1. A training method for a person having COPD for improving pulmonary endurance which comprises having such person engage in a daily pulmonary exercise session by inhaling through an adjustable restricted opening to provide resistance to inspiration and by exhaling without restriction, assessing said resistance to inspiration required to cause the patient to reach the point of stress by observing, but not limited to, symptoms as tiring, shortness of breath and increased pulse rate, adjusting the restricted opening such that the inspirational resistance throughout each daily session is less than that necessary to produce said stress, reassessing the resistance required to cause the patient to reach the point of stress by observing, but not limited to symptoms as tiring, shortness of breath, and increased pulse rate on a periodic basis, and increasing the inspirational resistance by decreasing the size of said opening for subsequent daily sessions, as tolerance to inspirational resistance increases.

4,533,138

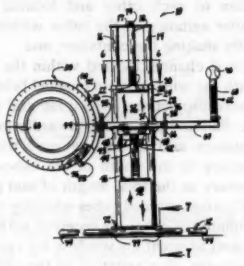
MULTIPLE SPORT TRAINING DEVICE

Alfonzo S. Rodriguez, Jr., and Jeffrey A. Anderson, both of Belmond, Iowa, assignors to Robert L. Wright, Des Moines, Iowa

Filed Jun. 1, 1982, Ser. No. 384,105
Int. Cl.³ A63B *69/40*
U.S. Cl. 273—26 R **9 Claims**

1. A multiple sport training device having interchangeable sport training attachments which may be selectively used and positioned at desired heights and angular orientations comprising:
a rigid support frame having a base and a generally vertically extending support having two parallel tubular members attached at their lower ends to said base and having cross supports between said tubes;
a vertically adjustable carriage mounted upon said vertically extending support, said vertically adjustable carriage comprising two tubular sleeves which slidably fit over said tubular members, said sleeves being inter-connected by a crossbar;

a vertical adjustment means comprising an elongated bar mounted between said tubular members, having a plurality of evenly spaced teeth along its length, said carriage being vertically adjustable along said elongated bar; means for changing and securing the position of said carriage along said vertically extending support; and



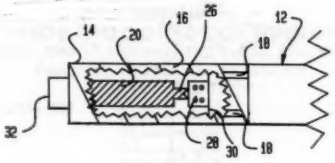
connector means mounted to said carriage for reception of said attachments, said connector means having means for selectively adjusting and securing said attachments at different attitudes around a horizontal axis so that said attachments can be presented at different selected attitudes to the user of said device.

4,533,139

NON-SLIP HANDLE WITH CODING MEANS

Abraham Goldin, 18 Russel Rd., North Haven, Conn. 06473, and Andrew G. Rodau, 17 Madison Ave. #11, Madison, N.J. 07940

Filed May 2, 1983, Ser. No. 490,438
Int. Cl.³ A63B *49/08*
U.S. Cl. 273—73 J **1 Claim**



1. A sporting implement having a non-slip handle, said non-slip handle comprising:

(a) a shaft for a hand to grasp, said shaft having portions defining a hollow;

(b) a valve located in said hollow;

(c) a replaceable pressurized cylindrical carbon dioxide gas container located in said hollow;

(d) an end cap which holds said carbon dioxide gas container in said hollow and forces said pressurized carbon dioxide container into puncturable contact with said valve; and

(e) means for cooling said shaft's exterior surface with said carbon dioxide gas controllably released from said pressurized carbon dioxide container by said valve, wherein said means for cooling includes conducting means which provides a continuous conduction path between said hollow and said exterior suffface of said shaft, said conducting means comprising:

(1) a plurality of metallic members extending between said hollow and said exterior surface of said shaft;

(2) a metallic liner for said hollow, said metallic members being in conductive contact with said liner; and

(3) metallized portions of said exterior surface, said metallized portions being in conductive contact with said metallic members, so that said continuous conductive path exists between said hollow and said exterior surface of said shaft.

4,533,140

ANIMAL DETERRENT DEVICE FOR JOGGERS

Preston L. Champion, 101 Independence Dr., Greenville, S.C. 29615

Filed Apr. 1, 1983, Ser. No. 481,337
Int. Cl.³ A63B *59/00*
U.S. Cl. 273—84 R **5 Claims**

1. An animal deterrent apparatus, consisting essentially of:

a palm-sized handle of six to eight inches in length adapted for hand gripping, said handle defining a cavity therein to act as a housing;

a plurality of generally rigid, tubular sections telescoping one within the other and substantially totally located within said housing when retracted thereinto and approximately consuming the volume of said housing; and

a pocket clip attached to said handle;

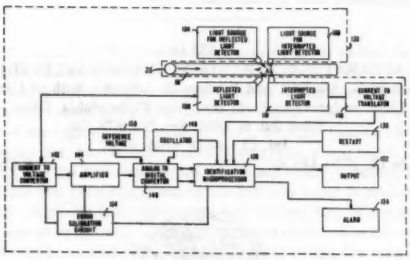
said plurality of sections when fully protracted extending to a length of substantially three feet and said apparatus weighing less than six ounces.

4,533,141

GAMING APPARATUS WITH COLOR SENSITIVE DETECTOR

Steven L. Foley, and David S. Bower, both of Ft. Lauderdale, Fla., assignors to Digital Products Corporation, Fort Lauderdale, Fla.

Filed Dec. 10, 1982, Ser. No. 448,829
Int. Cl.³ A63F *9/14*
U.S. Cl. 273—86 C **7 Claims**



1. A game apparatus comprising:

a group of movable elements each having a unique identifiable characteristic;

path means, defining a playfield, which each of said elements travels;

sensing means disposed at a predetermined location along said path, said sensing means generating a sequence of signals, each of said signals being representative of one of said unique characteristics and indicative of which one of said group of movable elements has passed said predetermined location;

processor means for comparing all of said signals to one

another to assign one of said unique characteristics to each signal of said sequence thereby identifying the order in which said movable elements passed said predetermined location, and

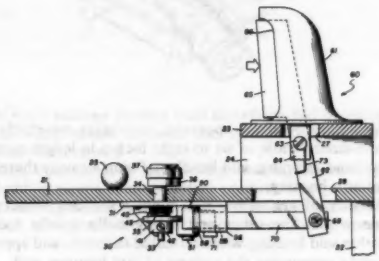
display means coupled to said processor means for displaying said order.

4,533,142

MECHANICALLY ACTUATED OBJECT-PROPELLING APPARATUS

Albin Peters, Chicago, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Sep. 6, 1983, Ser. No. 529,349
Int. Cl.³ A63B *71/00*
U.S. Cl. 273—129 W **20 Claims**



1. Propulsion apparatus for propelling an object along the playfield board of a game, said propulsion apparatus comprising: a permanent magnet mounted on the playfield board, object-propelling means, means movably mounting said object-propelling means on the playfield board and confining said object-propelling means to a predetermined oscillating movement thereto for propelling engagement with an associated object, said object-propelling means including a magnetic portion magnetically coupled to said permanent magnet and normally held in contact therewith by a predetermined magnetic coupling force, and manually operable actuating means coupled to said object-propelling means for applying thereto a force sufficient to overcome the predetermined magnetic coupling force to move said object-propelling means out of engagement with said permanent magnet and into propelling engagement with the associated object.

4,533,143

APPARATUS FOR RANDOM NUMBER SELECTION

Ronald G. Albright, and William D. Albright, both of Canton, Ohio, assignors to Fork, Inc., New Philadelphia, Ohio

Filed Jul. 6, 1984, Ser. No. 528,386
Int. Cl.³ A63F *3/06, 9/04*
U.S. Cl. 273—144 B **8 Claims**

1. A portable, hand held and manipulated apparatus for the random selection of numbers including:

(a) a cylindrical-shaped fluid tight container formed by an opaque cylindrical side wall and a pair of end walls;

(b) a fluid generally filling the container;

(c) a plurality of buoyant cubes having printed numerals on certain sides of the cubes contained in the fluid within the container;

(d) a rectangular-shaped transparent window provided in the side wall of the container and extending generally parallel with a longitudinal axis of said cylindrical-shaped container for viewing the printed numerals on a predetermined number of the cubes coming to rest and arranged in juxtaposition to each other and located adjacent said window after agitation of the cubes within the container by manually shaking the container; and

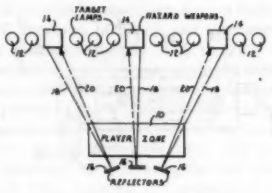
(e) an elongated channel located within the container and aligned with the window, said channel being formed by a pair of spaced projections formed integral with the cylindrical side wall and projecting inwardly into the interior of the container, said channel having a transverse width complementary to the width of the cubes and a length complementary to the total length of said predetermined member of juxtapositioned cubes whereby only the predetermined number of cubes are received within the channel and positioned adjacent the window for viewing by a user of said apparatus after agitation of the cubes within the container, with said agitation being assisted by the channel forming projections.

4,533,144

ELECTRONIC GAME

Manuel Juarez, 1403 Valentine Rd., Kansas City, Mo. 64111, and Neil Preston, Jackson County, Mo., assignors to Manuel Juarez, Kansas City, Mo.

Filed Jul. 11, 1983, Ser. No. 512,590
Int. Cl.³ A63F *9/02*
U.S. Cl. 273—311 **20 Claims**



1. Electronic game apparatus for use by a game participant stationed in a player zone of sufficient size to permit the participant to assume different positions in the player zone, said apparatus comprising:

a plurality of targets;

a target weapon for a game participant, said target weapon having trigger means for triggering the target weapon;

target hit indicating means for indicating when said target weapon is triggered while aimed at one of said targets;

hazard weapon means operable when activated to direct beams of simulated return fire at different areas of the player zone, said hazard weapon means emitting one active beam each time said hazard weapon means is activated whereby the game participant can evade each active beam by assuming a position in the player zone at which the active beam is not intercepted by the body of the game participant;

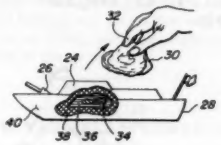
means for intermittently activating said hazard weapon means; and

player hit indicating means for indicating when an active beam or simulated return fire is intercepted by the body of the game participant.

4,533,145
LIQUID ABSORBING PLAYING PIECE

Bradley B. Liebman, Box 703, Germiston 1400, South Africa

Filed Aug. 22, 1984, Ser. No. 643,245
Int. Cl.[3] A63F 9/02
U.S. Cl. 273—378 6 Claims

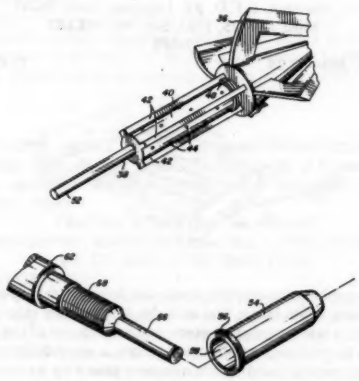


1. A playing piece for war game, comprising in combination:
(a) an inner core of permeable absorptive sheet material comprising a longitudinally rolled flattened ellipse wherein said inner core forms a hull structure of said playing piece in a war game;
(b) at least one intermediate layer of permeable absorptive sheet material rolled in layers perpendicular to the major axis of said inner core wherein said intermediate layer forms at least one layer of armor of said playing piece in a war game;
(c) an outer layer of permeable absorptive sheet material rolled in layers perpendicular to the major axis of said inner core wherein said outer layer forms an outer shell of said playing piece in a war game;
(d) means for varying the absorptive capacity of each of said inner core, intermediate and outer layers; and,
(e) means for visually identifying the extent to which a liquid incident upon said playing piece in said war game has penetrated said playing piece, thereby providing scoring data.

4,533,146
ARROW AND COMPONENTS THEREOF

John Schaar, 1048 W. Greenway Dr., Tempe, Ariz. 85282

Filed May 12, 1983, Ser. No. 493,958
Int. Cl.[3] F41B 5/02
U.S. Cl. 273—422 29 Claims

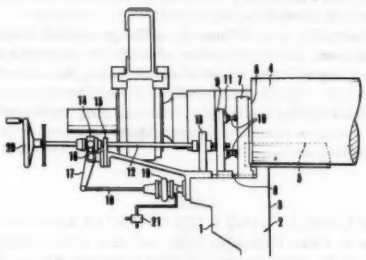


1. An adjustable weight arrow point assembly for use in conjunction with a tubular arrow shaft, comprising:
a point;
a rod coupled to said point and extending rearward thereof, said rod being trimmable to vary the weight of said point assembly;
a generally tubular insert adapted to be positioned within an end of said arrow shaft, said insert being provided with an outwardly extending annular flange portion at one end thereof which abuts against the edge of said end of said arrow shaft when said insert is positioned therein; and
a tubular sleeve fixedly coupled to and surrounding a portion of said rod adjacent said point, said sleeve being equipped with a plurality of projections on an outer surface thereof which frictionally engage an inner surface of said insert when said sleeve is positioned therein to secure said rod within said insert.

4,533,147
AUTOMATIC PRESSURE CONTROL APPARATUS FOR AN END-FACE SEAL PLATE IN SEAL MECHANISM OF HIGH PRESSURE STEAMER

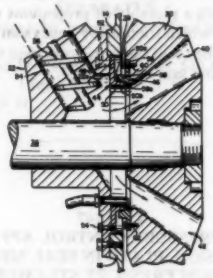
Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Jul. 24, 1984, Ser. No. 634,116
Claims priority, application Japan, Jul. 26, 1983, 58-115854[U]; Jul. 26, 1983, 58-115855[U]
Int. Cl.[3] F16J 15/54
U.S. Cl. 277—26 2 Claims



1. An automatic pressure control apparatus for an end-face seal plate in a seal mechanism of a high pressure steamer for wet-heat treatment of a textile product comprising: a seal mechanism, having a pair of seal rubber rolls located above a hole of the high pressure steamer body, through which a cloth is passed, for the purpose of sealing said hole, a seal block for supporting the seal rubber rolls which are freely rotatable, an end-face seal plate supported by the seal block and in pressure contact with the seal rubber rolls and the end face of the seal block so as to be freely slidable in the axial direction of the seal rubber rolls, an end-face seal plate support fitting for support of the end-face seal plate, a pressure control screw supported by means of a support fitting fixed to the seal block so as to be freely slidable in the axial direction of the seal rubber rolls, and a press-down plate movable in the axial direction of the seal rubber rolls by means of the pressure control screw, a pressure detector provided between said press-down plate and the end face of the seal rubber rolls for detecting the contact pressure between the end faces of the seal rubber rolls and the end-face seal plate, and an operation mechanism driven by means of a pressurized fluid so as to move said pressure control screw back and forth, thus allowing the end faces of the seal rubber rolls to make contact with the end-face seal plate under an appropriate amount of pressure.

4,533,148
SEALING RING ASSEMBLY FOR USE IN PULP REFINING EQUIPMENT
LeMoyne Lindahl, Rte. 2, Box 3340, Clatskanie, Oreg. 97018
Filed Oct. 4, 1984, Ser. No. 657,620
Int. Cl.³ F16J *15/48*
U.S. Cl. 277—53 **4 Claims**

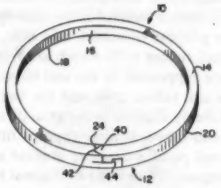


1. A sealing ring assembly for use in a pulp refiner unit including a housing which includes a pair of counter-rotating discs and a stock feed inlet mounted to the housing adjacent an opening provided therein for directing raw material toward the discs, comprising:

a seal ring defined by a circular flange section detachably mounted on the stock feed inlet within the housing opening and a projecting ring section extending from the flange section toward the discs; and

an inlet ring also defined by a flange section detachably mounted on the disc most adjacent the housing opening and a projecting ring section extending from the flange section toward the housing opening for concentrically receiving the seal ring's projecting ring section thereby defining an annular clearance region between the projecting ring sections.

4,533,149
SPLIT SEAL RING WITH INTERLOCKING CUT
George R. Vater, Clarendon Hills, and Aldo Allori, Brookfield, both of Ill., assignors to J. I. Case Company, Racine, Wis.
Continuation of Ser. No. 272,148, Jun. 10, 1981, abandoned. This application Jun. 10, 1983, Ser. No. 501,557
Int. Cl.³ F16J *9/14*
U.S. Cl. 277—221 **2 Claims**

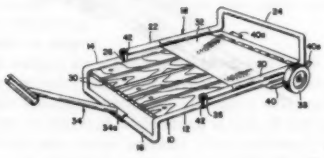


1. A split annular ring seal having a rectangular cross-sectional shape defined by spaced apart interior and exterior surfaces connecting top and bottom surfaces of said ring seal, the improvement comprising an interlocking fastening system connecting adjacent ends of said split annular ring seal by providing a detachable locking arrangement thereof in both radial and longitudinal directions including an interfitting wedge lock preventing radial displacement of said seal ends and a tongue and groove lock preventing longitudinal uncoupling thereof, each of said wedge and tongue and groove locks extends inwardly from one of said top and bottom surfaces and are circumferentially spaced from each other.

4,533,150
CURVED-BODY MANEUVERABLE SNOW BOARD
Carl D. Hardy, 113 Woodend La., Medfield, Mass. 02053
Filed Apr. 20, 1983, Ser. No. 486,850
Int. Cl.³ A63C *5/04*
U.S. Cl. 280—12 H **24 Claims**

1. A highly maneuverable rigid snow board comprising an elongated body, of substantially greater depth in midsection that at each end and substantially flat on the top surface, substantially vertical longitudinal side surfaces provided with equal opposing inwardly concave curves in the side surfaces forming a "waistlike" narrowed portion between wider front and rear sections in plan view, and a substantially arched bottom comprising a longitudinal downwardly convex curve forming a fulcrum point separating a substantially flat bottom sliding contact area from a smaller upturned rear backshift area, and further comprising, at a front end a small upturned tip portion, wherein the centerlines of both side concave curves and the centerline of the bottom fulcrum with each side curve forms a long continuous curved bottom turning edge, the major central portion of which curved bottom turning edge rests flush with a flat snow surface to steer the snow board approximately in the direction of edge curvature when the snow board is pivoted onto the fulcrum and tilted to either side onto the curved bottom edge.

4,533,151
COMBINATION CARRIER, CHAIR, AND LOUNGE/TABLE
Robert L. Maitland, R.F.D. #1, Lebanon, Conn. 06249
Filed Apr. 25, 1983, Ser. No. 488,142
Int. Cl.³ B62B *1/02*
U.S. Cl. 280—47.25 **17 Claims**



1. A combination carrier, chair, and lounge/table assembly comprising a first frame that includes two parallel side pieces joined by a transverse cross piece that extends out of the plane defined by said two parallel side pieces, a second frame that includes a pair of parallel side members joined by a transverse cross member that extends out of the plane defined by said two parallel side members, said parallel side members being pivotally connected to said parallel side pieces to permit said first and second frames to lie in one position adjacent one another, with the transverse cross piece and transverse cross member extending in opposed directions, and to be pivoted approxi-

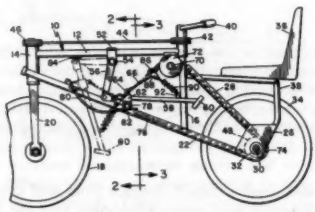
mately 180° to a second position in which said transverse cross piece and transverse cross member extend in the same direction, including an axle transversely spanning said side pieces at a location remote from said transverse cross piece and carrying a pair of wheels at the ends thereof, in which said transverse cross member and said axle are positioned adjacent each other in said one position of said first and second frames, including a pair of skids mounted adjacent said wheels to permit said assembly to be pulled along the ground on said skids and said wheels, said skids having end means that support the assembly in upright position in which said side pieces and side members are perpendicular to the ground.

4,533,152

AUTOMATIC VARIABLE SPEED LEVER ACTION DRIVE

Marion A. Clark, Tulare, Calif., assignor to Don Good, Tulare, Calif., a part interest

Filed Mar. 26, 1984, Ser. No. 593,518
Int. Cl.[3] B62M *1/08*
U.S. Cl. 280—251 **7 Claims**



1. In a wheeled vehicle having a frame with a forward end portion and a rear portion with at least one driven wheel therein, an automatic variable speed lever action drive, comprising:

a pair of pedal levers having forward ends pivotally attached to said frame to swing substantially vertically on opposite sides of the frame, said levers extending rearwardly and having foot pedals on the rear ends thereof;

drive means connecting each of said levers to said driven wheel, each drive means including an extensible and retractable cable;

said cable being secured at one end to said lever adjacent the forward end;

a tension pulley mounted to roll on the cable; and

a tension spring connecting the tension pulley to the rear portion of the lever for applying a deflection to the cable in proportion to the existing tension on the cable.

4,533,153

FRONT BRAKE SYSTEM FOR MOTORCYCLES

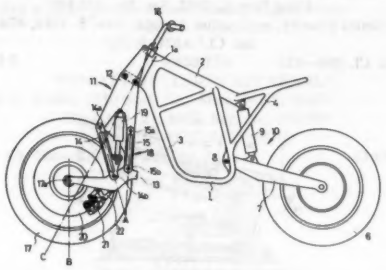
Kazuhiko Tsunoda, and Shigeru Hattori, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1982, Ser. No. 414,308
Claims priority, application Japan, Sep. 7, 1981, 56-141526
Int. Cl.[3] B62K *25/04;* B60G *17/06*
U.S. Cl. 280—277 **5 Claims**

1. In a motorcycle provided with a front suspension system comprising a link mechanism having a quadrilateral side configuration wherein an upper fork secured to the front of a vehicle body frame so as to be pivotable to the right and left and a lower fork which supports a front wheel are interconnected through two front arms and two rear arms, a front brake system comprising:

a brake disc integrally fixed to said front wheel and held rotatably thereby;

a brake caliper for braking said front wheel by pressing a brake pad thereof against said brake disc, said brake caliper being disposed below said lower fork and behind a perpendicular line passing through a front wheel axle; and



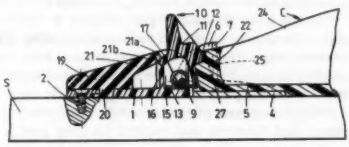
one end of said brake caliper being pivotably connected to an axle portion and the other end thereof being pivotably connected to a tip end of one said arm through a torque rod.

4,533,154

CROSS-COUNTRY SKIING ASSEMBLY

Jean Bernard; Jean J. A. Beyl, both of Nevers; Christian Campillo, Garchizy, and Daniel Le Faou, Varennes Vauzelles, all of France, assignors to Ste LOOK, Nevers, France

Filed Mar. 1, 1983, Ser. No. 471,212
Claims priority, application France, Mar. 5, 1982, 82 03673
Int. Cl.[3] A63C *9/00*
U.S. Cl. 280—615 **9 Claims**



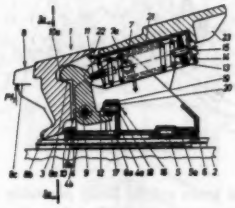
1. A cross-country skiing assembly comprising a ski shoe and a device for fixing said shoe on a ski, in which the front portion of the ski shoe has a fastening contour when looking from above whilst the ski binding device comprises a shoe-retaining stirrup provided with fastening means of complementary shape, wherein the shoe-retaining stirrup is pivotally mounted on the ski by means of a transverse pivot-pin placed immediately in front of the tip of the ski shoe, and a locking member acted upon by an elastic element and adapted to cooperate with the front portion of the ski shoe in such a manner as to permit automatic positioning of said shoe by downward engagement within the shoe-retaining stirrup and to prevent withdrawal of said shoe under an upwardly directed force, the front portion of the ski shoe having an inclined front face which is capable of thrusting back the locking member during positioning of the shoe and is provided with a top recess for receiving a nose of said locking member by snap-action engagement after positioning of the front end of said shoe within said shoe-retaining stirrup.

4,533,155

SAFETY SKI BINDING

Erwin Krob, and Helmut Bauer, both of Vienna, Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Nov. 1, 1982, Ser. No. 438,549
Claims priority, application Austria, Nov. 5, 1981, 4743/81
Int. Cl.³ A63C 9/085
U.S. Cl. 280—628 **8 Claims**



1. In a safety ski binding which includes a sole holder which is pivotal about a transverse axis and a vertical axis and is held in a position in which it can releasably hold a ski shoe by a locking mechanism which yields only after a predetermined release force is exceeded, the magnitude of said predetermined release force decreasing as an angle between the direction of application thereof and a vertical reference increases, wherein first and second locking parts of said locking mechanism are provided at spaced locations on a pivotally supported lever, wherein a first complementary locking member which is cooperable with said first locking part is provided on a rear portion of said sole holder and a second complementary locking member which is cooperable with said second locking part is provided on a structural part which is fixed against movement with respect to the ski, and wherein said lever is supported for pivotal movement about a holding axle which extends parallel to said transverse axis and which is supported on a support member which is in turn pivotal about a pivot pin which defines said vertical axis and is anchored in a base plate, said lever having at a location remote from said first and second locking parts a control surface and said binding having a release spring and means for causing a biasing force from said release spring to be applied to said control surface, the improvement comprising wherein said structural part which is fixed against movement with respect to the ski includes a locking bolt and a roller rotatably supported thereon, said locking bolt extending approximately longitudinally of the ski and being supported by an abutment which is provided on said base plate, said locking bolt and roller being part of said second complementary locking member, and wherein said second locking part is an upwardly facing cam surface which is provided on said lever, which extends substantially transversely with respect to the longitudinal axis of the ski, which can engage an underside of said roller, which has a locking recess for receiving said roller and for preventing lateral movement thereof in a downhill skiing position of said binding, and which has adjacent and on each side of said locking recess a respective curve section which extends toward a respective side of the ski for controlling a release during a twisting fall.

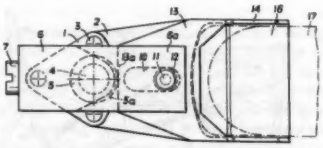
4,533,156

TOE MECHANISM FOR A SAFETY SKI BINDING

Ulrich Gertsch, Interlaken, Switzerland, assignor to TMC Corporation, Baar, Switzerland

Filed Dec. 22, 1981, Ser. No. 333,530
Claims priority, application Switzerland, Dec. 30, 1980, 9635/80; Oct. 13, 1981, 6522/81
Int. Cl.³ A63C 9/085
U.S. Cl. 280—629 **18 Claims**

1. A toe holding mechanism for a safety ski binding adapted to releasably hold a ski boot on a ski, comprising: a toe holder engageable with a front end of a sole of said ski boot; a support plate provided on said toe holder and extending under and supporting the sole of said ski boot when said front end thereof is engaging said toe holder, said support plate extending rearwardly below the sole of said ski boot a maximum distance of approximately half the length of the sole of said ski boot and being free of operative connection to the ski at a rear end thereof; means supporting said toe holder and support plate for pivotal movement about a generally vertical axis and for movement generally transversely of the ski; resilient means for yieldably resisting transverse movement of said toe holder and support plate in either direction away from an initial position; means supporting said toe holder and support plate for movement generally longitudinally of the ski after they have moved transversely a predetermined distance away from said initial position; and keying means cooperable with the sole of said ski boot and at least one of said toe holder and support plate for preventing pivotal movement about a further vertical axis of the sole of said ski boot relative to said toe holder and support plate during transverse movement of said toe holder and support plate until said toe holder and support plate have moved



at least said predetermined distance from said initial position thereof; wherein said means supporting said toe holder and support plate for pivotal and transverse movement includes a release member supported for pivotal movement about a generally vertical pivot axis, said resilient means yieldably resisting pivotal movement of said release member away from a position in which said toe holder is in said initial position, a generally vertical pin provided on said release member at a location spaced radially from said pivot axis thereof in a direction toward the rear end of the ski, and a recess which is provided in said toe holder and rotatably receives said pin; wherein said means supporting said toe holder and support plate for movement generally longitudinally of the ski includes said recess in said toe holder being a slot which slidably receives said pin and extends generally longitudinally of the ski when said toe holder is in said initial position; and including means for preventing longitudinal movement of said toe holder and support plate toward the tip of the ski relative to said release member until said toe holder and support plate have moved transversely at least said predetermined distance from said initial position.

4,533,157

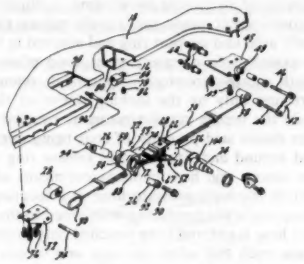
REAR OFFSET AXLE SUSPENSION SYSTEM FOR VEHICLE

Walter A. Hoenle, Warren; David J. Perkins, Royal Oak, and James L. Schenten, Sterling Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 19, 1984, Ser. No. 591,350
Int. Cl.³ B60G 11/02
U.S. Cl. 280—718 **2 Claims**

1. A rear axle suspension apparatus for the rear wheels of a motor vehicle, the vehicle having a body with laterally spaced apart left and right side frame members, each frame member having a jounce bumper supported on the underside thereof, the suspension apparatus comprising; left and right longitudinally extending leaf springs having their fore and aft ends pivotally connected on said body; a non-driving rear axle assembly rotatably supporting left and right road wheels on axially aligned spindle shafts; said axle assembly having a

transversely extending tubular axle member and a pair of mirror image left and right castings, each said casting having an inboard portion attached to one end of said tubular axle member and an outboard L-shaped angle portion formed intergral with an intermediate bridge portion; said L-shaped angle portion including a vertical spindle mounting plate and a horizontal attaching plate seating the central portion of its associated leaf spring; each said attaching plate positioned to locate its leaf spring intermediate portion a predetermined distance



above said tubular axle member and below the spindle shaft axis; each said casting having a substantially horizontally disposed jounce plate providing a jounce deflection stop for its associated side frame bumper; whereby said tubular axle member and said spindle shafts are constrained to move in substantially equal vertical paths throughout the travel of said axle assembly between its uppermost jounce and its lowermost rebound deflections so as to clear vehicle components supported on the underside of said body and reduce the height of said vehicle.

4,533,158

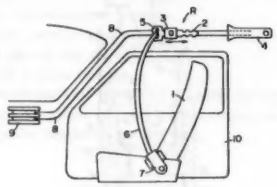
SEAT BELT LATCH DEVICE

Takeo Ueda, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Japan

Continuation of Ser. No. 62,550, Jul. 31, 1979, abandoned. This application Dec. 5, 1980, Ser. No. 213,475

Int. Cl.[3] **B60R** *21/10*

U.S. Cl. 280—804 **3 Claims**



1. A latch device mountable within a vehicle for holding securely a tongue portion attached to the end portion of a seat belt unwound from a retractor secured to the vehicle, said latch device including a latch portion adapted to receive said tongue portion for holding it securely in place; drive means for moving said tongue portion toward said latch portion upon closing of the vehicle door and way from said latch portion during opening of the vehicle door; said latch portion including a movable retaining member biased into a position engaging said tongue portion in its forward position; said tongue portion including a base portion secured to the end portion of said seat belt, and a movable portion held slidably to said base portion and attached to said drive means so as to be slid rearwardly long said base portion when the vehicle door is opened; said base portion being adapted to be held by said retaining member and said movable member having a cam surface moving said retaining member out of engagement with said base member during rearward movement thereof to release said tongue portion during opening of the vehicle door; and further including means to dis-connect said movable member from said drive means when said drive means exerts on said movable member a force greater than a predetermined value.

4,533,159

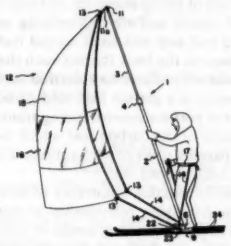
WIND PROPULSION APPARATUS

John C. Seidel, 1010 State St., Alma, Mich. 48801

Filed Apr. 27, 1984, Ser. No. 604,999

Int. Cl.[3] **A63C** *3/00, 11/00*

U.S. Cl. 280—810 **12 Claims**



1. Wind propulsion apparatus for propelling a person equipped with skis or skates across a surface, said apparatus comprising a mast; a sail; means for connecting said sail to one end of said mast; means carried by said mast at its other end for supporting said mast in a generally upright condition; first and second guide means; mounting means for mounting said guide means on such person's feet; and first and second sheets secured to said sail and extending through and beyond the respective guide means for manipulation by such person.

4,533,160

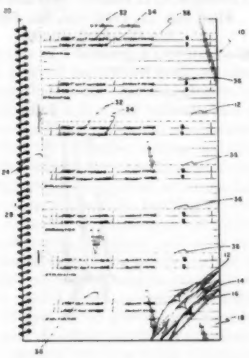
GENERAL JOURNAL FORM

Harold H. Malone, 3900 E. Waterman, Wichita, Kans. 67218

Filed Dec. 6, 1982, Ser. No. 447,281

Int. Cl.[3] **B41L** *1/24, 1/20, 3/00*

U.S. Cl. 282—23 R **1 Claim**



1. A general journal form comprising, in combination, a top record leaf;

a pressure sensitive self-contained leaf;

transfer means;

and a back record leaf, all bound together as pages of a book in order stated at a common border;

said top record leaf, said pressure sensitive self contained leaf, and said back record leaf all having identical printed matter and lines in overlying registry for record keeping extending transversely across each;

said identical printed matter and lines being repeated on said top record leaf, said pressure sensitive self contained leaf and said back record leaf at equally spaced intervals a plurality of times from the upper to the lower portion or each of the three leaves;

and parallel rows of perforations extending transversely across the entire width of said top record leaf and said back record leaf contiguous to the upper extremities of each of said equally spaced repetitive printed matter on said top record leaf and on said back record leaf to provide for detachable sections of said top and said back leaf;

said parallel rows of perforations on said top record leaf and on said back record leaf are in overlying registry;

said top record leaf and said back record leaf each include adhesive means on the back thereof such that when moistened the backs will adhere to a desired surface;

said transfer means is a carbon leaf, said carbon leaf having parallel rows of perforations extending transversely across the entire width of the carbon leaf which overly in registry with the parallel rows of perforations of the top record leaf and the back record leaf;

a binding means for binding a plurality of said general journal form in an overlying relationship as pages of a book;

said top record leaf, said pressure sensitive self contained leaf and said back record leaf each include debit indicia and credit indicia;

said top record leaf and said record leaf additionally respectfully comprises a top record leaf border member and a back record leaf border member respectfully secured to each leaf by a vertical top record leaf perforate line and a vertical back record leaf perforate line;

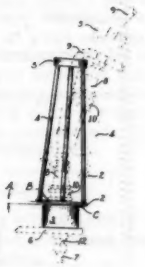
said pressure sensitive self contained leaf and said carbon leaf also respectfully comprises a pressure sensitive self contained border member and a carbon leaf border member respectfully secured to said pressure sensitive self contained leaf and carbon leaf by a vertical pressure sensitive self contained perforate line and a vertical carbon leaf perforate line.

4,533,161

AUTOMATIC HIGH PRESSURE HOSE UNCOUPLING DEVICE

Donald D. Burke, 9719 N. Flora, Kansas City, Mo. 64155, and Jerry L. Cloninger, 8212 Hadley, Overland Park, Kans. 66204

Filed Sep. 21, 1982, Ser. No. 420,646
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—1 **1 Claim**



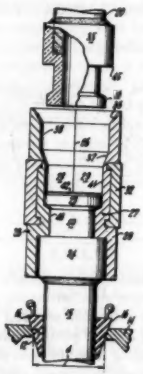
1. A high pressure coupling disconnecting device for use with a high pressure coupling means provided with male and female halves interlocked when coupled by engagement of a plurality of balls housed in the female half of said coupling which engage an annular recess in the male half of said coupling, the balls retained in place by a locking sleeve around the female half of the high pressure coupling such that movement of the sleeve away from the coupled end of the female coupling half allows the balls to retreat from the recess in the male coupling half permitting the high pressure coupling to seperate, said disconnecting device comprised of (a) an annular support ring means adapted to concentrically surrounding the high pressure male coupler means, said support ring adapted to be fixably attached by the high pressure male coupler means to a base element means, and (b) an elongated tower element means consisting of an annular release ring, a plurality of rods and a hose containment means, said annular release ring resting concentrically atop said support ring and adapted to be around the high pressure male coupler means, said release ring is provided with an aperture sized to permit its retension atop said support ring only by the locking sleeve of the female coupler while the female coupler means is coupled with the male coupler means said plurality of rods being circumferentially spaced around and fixed to said release ring and hose containment means, said hose containment means adapted to loosely encircle the high pressure hose at a location remote from said coupling while remaining unattached to the hose the high pressure hose is adapted to be attached only to said female coupler means, such that when the male and female couplers are connected and under pressure sufficient tension applied by the high pressure hose against said hose containment means from an angle will impart leverage through said tower element means displacing said release ring against both said support ring and the female coupler locking sleeve with sufficient force to displace the female coupler locking sleeve permitting the high pressure coupling means to disconnect.

4,533,162

STABBING BOX AND SAFETY SLIP FOR MAKING TUBING CONNECTIONS

Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Mar. 11, 1983, Ser. No. 474,407
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—27 **7 Claims**



1. Stabbing box and safety slip for use in making tubing connections during running of tubing into a well, said tubing having flanged tips on end connectors, said end connectors being adapted for abutting contact prior to clamping in order to join sections of tubing together, said stabbing box and safety slip comprising

a split body having one end adapted for clamping onto one of said end connectors and its flanged tip,

the other end of said body member having tapered guide means for receiving and guiding another one of said end

connectors and its flanged tip into abutting relation with said one connector in said one end of the body member.

4,533,163

METHOD AND APPARATUS FOR MAKING KNOTTED RUGS

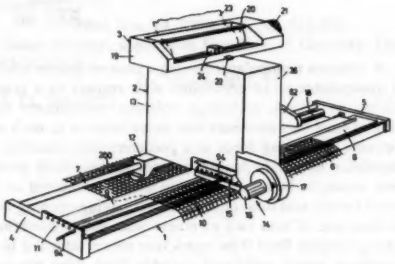
Stephan Rosenberg, Muri, Switzerland, assignor to MADAG Maschinen- und Apparatebau Dietikon AG, Zurich, Switzerland

Filed Jun. 22, 1983, Ser. No. 506,619

Claims priority, application Switzerland, Jun. 28, 1982, 3954/82

Int. Cl.³ B65H *69/04*

U.S. Cl. 289—1.5 **16 Claims**



1. A method of making rugs by double knotting, of the type wherein a knotting apparatus is transported by a drive mechanism over a double-thread canvas fixed on a canvas holder, and the knotting yarn is fed by feed means, comprising the steps of:

setting cam plates in rotation by means of the drive mechanism for actuating various tools for carrying out the knotting operation,

drawing the yarn to be knotted into the knotting zone by means of first yarn-transport means,

conveying the yarn into the region of a needle by means of second yarn-transport means,

pushing the needle between the two threads of a double-thread pair in the canvas,

cutting off a piece of yarn,

leading both ends of the piece of yarn through the needle aperture by means of third yarn-transport means, and

retracting the needle to form a knot.

4,533,164

EQUIPMENT FOR KNOTTING AUTOMATICALLY THE OPENINGS OF FLEXIBLE CONTAINERS

Angel Lorenzo Barroso, Arquitecto Cabanes, s.n., Mataro (Barcelona), Spain

Filed Apr. 22, 1983, Ser. No. 487,766

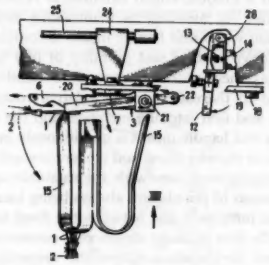
Claims priority, application Spain, Apr. 23, 1982, 512.263; Apr. 23, 1982, 265.171[U]

Int. Cl.³ B65H *69/04*

U.S. Cl. 289—2 **8 Claims**

1. An apparatus for knotting openings in flexible containers such as sausage skins including means for forming a loop with a string, the improvement comprising:

hook means for engaging a loop which is attached to a container, means for moving said hook means with reciprocating motion along the path between a loop engaging and a loop discharging position, means for discharging a



loop from said hook means when in said loop discharging position onto a storage means.

4,533,165

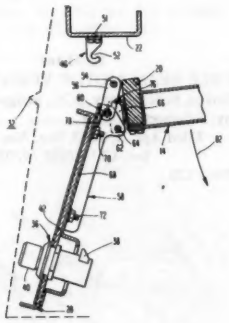
LATCHING SYSTEM

Robert D. Edelman, 6678 Pickwick Dr., Cornwells Heights, Pa. 19020

Continuation of Ser. No. 322,216, Nov. 17, 1981,. This application Jan. 23, 1984, Ser. No. 572,959

Int. Cl.³ E05C *9/00*

U.S. Cl. 292—68 **6 Claims**



1. The combination of a housing, a closure for said housing movable between opened and closed positions about a linear pivot axis, gasketing means between said closure and housing for assisting in providing a firm seal between said closure and said housing when said closure is locked in said closed position, and a latching system for releasably locking said closure to said housing when said closure is in a closed position; characterized in that the latching system includes an actuating handle means for controlling the operation of the latching system, said handle means being rotatably connected to said closure about a plurality of pivot mounting pin means, said pivot mounting pin means being aligned along an axis parallel to said linear pivot axis and each of said pivot mounting pin means being pivotally retained in axially spaced-apart members attached to said closure; a plurality of first latching members spaced-apart from each other in a linear direction parallel to the linear pivot axis, each of said first latching members being adapted to engage a second cooperable latching member connected to the housing for locking the closure to the housing; each of said first latching members being pivotally connected to the handle means at a fixed location through linearly aligned, spaced-apart connections for permitting rotational movement of each of said latching members relative to said handle means in a plane generally perpendicular to said linear pivot axis, said fixed location being

offset from the axis along which the plurality of pivot mounting pin means are aligned; spring means engaging each of said first latching members for biasing each of said latching members into a predetermined orientation relative to the handle means and for assisting in maintaining said predetermined orientation when said handle means is rotated in a first direction to move each of said plurality of first latching members into engagement with said second cooperable latching members, and to thereafter permit relative rotational movement between said first latching members and the actuating handle means as said handle means is continuously moved in said first direction to thereby draw said closure toward the housing into sealing engagement therewith; the rotatable connections of the handle means to the closure always being located on the same side of an imaginary line between the fixed location at which each of the first latching members is connected to the handle means and the location where the respective first latching member engages its cooperable second latching member for maintaining the housing and closure in sealing engagement with each other, whereby a non-overcenter latching system is provided for the housing and closure, and lock means for removably securing the handle means to the closure for maintaining the closure in sealing engagement with the housing, rotational forces imposed on the handle means in a direction for rotating the handle means in a second direction away from said closure when said lock is unsecured being provided solely by said gasket means and said spring means.

4,533,166

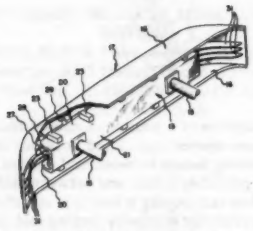
DOUBLE BEAM MOTOR VEHICLE BUMPERS

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,681

Int. Cl.³ B60R *19/08*

U.S. Cl. 293—120 **4 Claims**



4. A bumper for a vehicle comprising:

an inner beam member of moldable thermoplastic;

two longitudinally separated bumper supports for affixing said bumper to said vehicle;

an outer beam member of moldable thermoplastic, said outer beam member being a channel section shaped member having two substantially parallel sides joined by a vertical portion; and

interbeam support means integrally joined to said parallel sides within the interior of said channel section shaped member, and interbeam support means being longitudinally displaced from said bumper supports so that said interbeam support means is not transversely aligned with said longitudinally separated bumper supports, said interbeam support means affixing said inner and outer beam members, said inner and outer beam members absorbing the impact force in a collision.

4,533,167

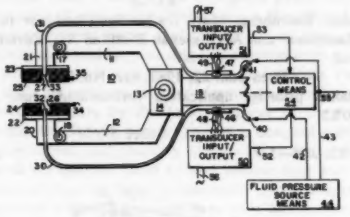
ROBOTICS MANIPULATOR WITH GRIPPING FORCE CONTROL MEANS

Robert G. Johnson, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 13, 1984, Ser. No. 579,614

Int. Cl.³ B25J *15/02*

U.S. Cl. 294—86.4 **16 Claims**



1. A robotics manipulator having a control system allowing said manipulator to be controlled with respect to a gripping force on an object, including: robotics manipulator means having at least two members that move relative to each other to provide a gripping force at a predetermined location; said manipulator means including control means; fluid pressure source means including connection means connected to fluid channel means; said fluid channel means having opening means in at least one of said two members near said predetermined location; variable fluid flow restriction means attached to said manipulator means with said variable fluid flow restriction means changing in fluid flow restriction characteristics as said two members increase said gripping force at said predetermined location upon said manipulator means gripping said object; said fluid flow restriction means changing the fluid flow and changing a fluid condition in said fluid channel means; transducer means responsive to said changing fluid condition in said channel means; and said transducer means connected to said manipulator control means to feed back a signal indicative of said gripping force.

4,533,168

MOTOR CAR WITH FLOW STEPPED TAIL AND AIR-CONDUCTING MEANS

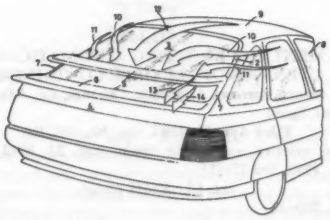
Lutz J. Janssen, Munich, and Friedl W. Wülfing, Pulheim-Brauweiler, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 17, 1982, Ser. No. 408,955

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132369

Int. Cl.³ B62D *35/00*; B60J *9/00*

U.S. Cl. 296—1 S **1 Claim**



1. In a motor vehicle of the type having a tail window surface sloping downwardly and rearwardly from the vehicle roof and a rear spoiler positioned proximate the rear terminus of the tail window surface, the rear spoiler presenting an up-

wardly rearwardly extending upper surface to air flow proceeding downwardly along the tail window surface to define a transition area for the air flow at the juncture of the rear spoiler and the tail window surface wherein air flow is turbulent, a wing assembly having a wing including a rounded leading edge and a convex lower surface extending transversely across the tail window and being positioned above the transition area and longitudinally intermediate the vehicle roof and the transition area, and a pair of side arm members integrally formed with the wing and the rear spoiler to define a unitary assembly, the length of the arms and the angular relationship of the wing to the air flow down the tail window surface being fixed to minimize turbulent flow in the transition area, and to reduce air resistance.

4,533,169

SPARE WHEEL ARRANGEMENT IN MOTOR CARS

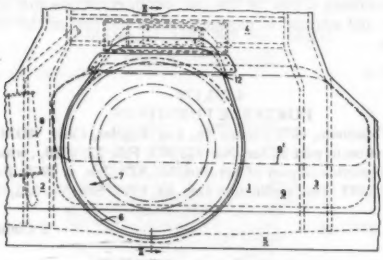
Axel Rauthmann, and Harry Pietsch, both of Pulheim, Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1983, Ser. No. 561,395

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3247979

Int. Cl.³ B60P *3/22*

U.S. Cl. 296—37.2 **2 Claims**



1. A spare wheel arrangement for a motor car in which the spare wheel having a rigid rim and the fuel tank are disposed adjacent one another below the motor car rear loading area in a partly overlapping manner, and in which the spare wheel is disposed in a depression in the floor and the fuel tank is disposed below the floor, the spare wheel having a tendency to rise at its forward end from the depression in the case of a rear-end collision, characterized in that the front end of the depression is covered by a retaining plate which, in the event of a rear-end collision at relatively low speeds, acts in conjunction with the rim of the spare wheel to brace the floor against excessive deformation.

4,533,170

STROLLER COVER AND SUPPORT FRAME THEREFOR

Joseph R. Banks, 1436 Elizabeth Dr., and Dennis G. Banks, 2042 Boggs Ave., both of Pittsburgh, Pa. 15221

Filed Jul. 5, 1983, Ser. No. 510,676

Int. Cl.³ B60J *9/00*

U.S. Cl. 296—78 A **8 Claims**

1. A support frame adapted for supporting a protective cover with respect to an infant conveyance such as a stroller comprising:

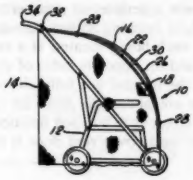
a plurality of elongated resiliently flexible structural elements;

said plurality of elongated structural elements including a plurality of elongated resiliently flexible rod elements;

elongated bridge means interconnecting at least two of said plurality of rod elements which are spaced transversely apart;

flexible connecting means securing said bridge means with respect to said at least two rod elements in a manner that said frame is collapsible without disassembly thereof to form a bundle of said plurality of elongated resiliently flexible structural elements; and

securing means cooperable with such an infant conveyance for selectively securing longitudinal end portions of said at least two rod elements to such infant conveyance in a manner that said at least two rod elements are maintained



with respect to such infant conveyance in an outwardly bowed configuration and at a transverse spacing determined by said bridge means and by the relative locations of one of said securing means with respect to others of said securing means to provide a self supporting frame for support of such a protective cover with respect to such infant conveyance.

4,533,171

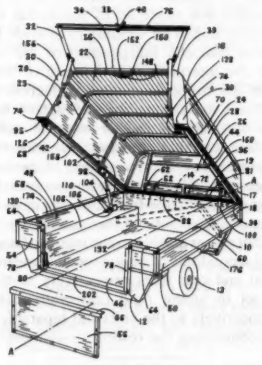
LIFT-ROOF TRAILER

W. H. Russell Lake, Lathrup Village, Mich., assignor to Trail-R-Van Inc., Lathrup Village, Mich.

Filed Mar. 14, 1983, Ser. No. 474,963

Int. Cl.³ B60P *3/32*

U.S. Cl. 296—173 **20 Claims**



1. A closed trailer comprising:

a cover having a roof, a left wall, a right wall, a forward wall and a rearward wall, each wall optionally including one or more windows and the rearward wall also including a door pivotally attached about a lateral axis in proximity to the rearward edge of the roof and having latching means lockable from an exterior location; said cover being pivotally attached about a lateral axis in proximity to the lower edge of the forward wall to the forward end of a suitable load bed;

said suitable load bed having wheels, coupling means, a floor, a left wall, a right wall, a forward wall and a rearward wall, said rearward wall including an opening, and/or removable, tailgate; said tailgate being retained as a closing portion of the rear wall in such a way as to be openable and/or removably only when the cover is raised

at its rearward end from a closed position and/or the cover rear door is in an unlatched or open condition;

said suitable load bed being of such dimensions relative to said cover that, with said cover in a fully lowered position relative to said load bed, opposing perimetral interfaces are formed between the lower edges of the walls and rear door of said cover and the upper edges of the walls and tailgate of said load bed such that insertion of suitable sealing means between said opposing perimetral interfaces shall provide a perimetral weather seal therebetween;

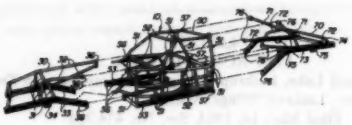
a left and right latching means between the cover and the load bed, each being located at a rearward position outboard of and on opposite sides of the cover rear door so that, with the tailgate in a fully closed position, said latching means are accessible from an outside location only when the cover is in a raised position relative to the load bed and/or said cover rear door is in an open position.

4,533,172

DISCONNECTABLE AUTOMOTIVE VEHICLE FRAME

Gary R. Oliver, c/o Tri-City Buggy, 2135 - 11th St., Rock Island, Ill. 61201

Filed Feb. 6, 1984, Ser. No. 577,172
Int. Cl.³ B62D *31/00*
U.S. Cl. 296—185 **1 Claim**



1. An automotive vehicle frame comprising front, intermediate and rear units disposed in end-to-end alignment to establish a fore-and-aft elongated rigid framework, each unit being of skeletal construction made up of horizontal and vertical rib elements rigidly united by welding to provide a unitized cage-like structure, basically independent of the other units, the elements of the intermediate unit being of relatively strong, stiff material affording substantial protection for a driver in crash conditions, and the members of each of the front and rear units being of relatively lighter material deformable under crash conditions and thus effective to cushion the intermediate unit against crash forces, the members of the intermediate unit being further weldable as among themselves, the material of the members of each of the front and rear units being such that the members of each front and rear unit are weldable as among themselves but non-weldable to the intermediate unit members, and first and second sets of disconnectable means rigidly securing the front and rear units respectively to the intermediate unit, each set including rigid cooperative elements rigidly attached respectively to the units and separable rigid fasteners rigidly interconnecting the respective elements.

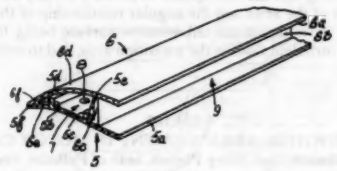
4,533,173

GUIDE RAIL FOR SLIDING ASSEMBLY

Bender A. Davis, Sandton, and Hendrik A. Louw, Port Elizabeth, both of South Africa, assignors to Carvalette Services Africa (Proprietary) Limited, Johannesburg, South Africa

Filed Apr. 26, 1983, Ser. No. 488,859
Int. Cl.³ B60J *7/02*
U.S. Cl. 296—216 **9 Claims**

1. A guide rail (1) for a sliding sun roof (2) of a motor vehicle, comprising: a first member (5) adapted to be secured to the roof (3) of the motor vehicle and having a first flange (5*a*), and a second member (6) adapted to be engaged with the first member and also having a first flange (6*a*) and a second flange (6*b*) generally perpendicular thereto, the first flanges of the first and second members and the second flange of the second member in an operative arrangement of the guide rail forming a guide channel (9) with the second flange being a base thereof, wherein the first and second members are provided with complementary formations adapted to be engaged with one another to permit sliding engagement of the second member with the first member, the first member being provided with an open ended channel (7) formed by a pair of flanges (5*b*, 5*c*) directed in a direction generally perpendicular to the first flange, the open ended channel being adapted to accommodate



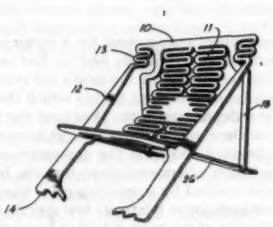
means (8) for securing the first member to the roof of the motor vehicle, the formations on the first member comprising a lip (5*d*, 5*e*) on each of the flanges which form the open ended channel on the first member, the lips on the flanges being directed away from one another and being parallel to the first flange of the first member, the formations on the second member comprising a pair of lips (6*c*, 6*e*) directed towards one another and adapted to engage beneath the lips on the first member.

4,533,174

PORTABLE FURNITURE

Gregg Fleishman, 6071 Hargis St., Los Angeles, Calif. 90034

Continuation-in-part of Ser. No. 123,903, Feb. 22, 1980, , which is a continuation-in-part of Ser. No. 866,837, Jan. 4, 1978, Pat. No. 4,202,581. This application Dec. 18, 1981, Ser. No. 332,151
Int. Cl.³ A47C *4/00*
U.S. Cl. 297—16 **3 Claims**



1. Portable furniture generally comprising at least one uniformly thick originally planar support member and a uniformly thick originally planar furniture member, wherein said furniture member is a chair seat,

said support member having integral portions adapted to be resiliently disposed in angular and curvilinear relationship to each other providing for support,

said support member having integral interlocking means for releasably securing said integral portions in said angular and curvilinear relationship,

said support member able to return to its original planar form when said interlocking means are disengaged,

said support member generally oriented vertically and said furniture member generally oriented horizontally,

said interlocking means additionally releasably securing said furniture member to said support member,

said integral portions of said support member comprising a back portion, two L-shaped main portions, and two brace arm portions,

said back portion and the lower part of said brace arm portions

comprised to be relatively more flexible and resilient than said other portions,

said back portion formed generally fan shaped and connected to the tops of said two "L"-shaped main portions at each end, said "L"-shaped main portions in opposed orientation angling down and inwardly,

when said furniture is in its assembled mode, said main portions are held vertically opposing each other by said interlocking means on side edges of said chair seat with the back portion in a rearward tilting cylindrical arc connected therebetween,

said main portions contacting the ground surface in parallel configuration pointing rearwardly with the front edges of said main portions integrally connected to the lower part of said brace arm portions,

said brace arms adapted to be angularly disposed inwardly with the top ends of said brace arms having interlocking means to the front of the bottom of said chair seat,

said back portion generally resiliently conforming to the shape of a seated person when said support and furniture members are in their assembled condition,

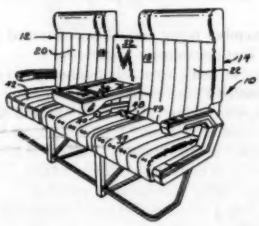
said members able to return to their original planar modes when disengaged.

4,533,175

CONVERTIBLE SEAT

Edward J. Brennan, Litchfield, Conn., assignor to PTC Aerospace Inc., Bantam, Conn.

Filed Dec. 23, 1983, Ser. No. 565,242
Int. Cl.³ A47C *15/00*
U.S. Cl. 297—232 **4 Claims**



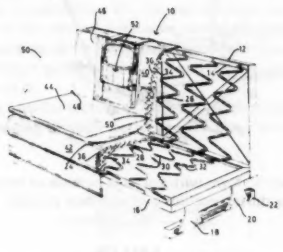
1. A convertible seat assembly which is quickly changeable between a first configuration having three relatively narrow seating positions with intermediate relatively narrow armrests, and a second configuration having two relatively wide seating positions with an intermediate relatively wide armrest, said assembly having three separately reclinable back frame members with the center seat back frame member being narrower than the end seat back frame members, the center seat back frame member having a back cushion portion which is pivotally mounted for movement between a generally vertical use position contacting said center back frame member in said first configuration for supporting an occupant's back, to a generally horizontal cocktail table and/or armrest position overlying the center seat bottom cushion in said second configuration, the center position back cushion portion having a width which is generally equal to the width of the center back frame member and less than the width of the end position back cushion portions, a pair of detachable back cushion extension members which are selectively attachable by complementary fastening means to each side of the center position back cushion portion in said first configuration, and to the inboard sides of the end cushion portions in said second configuration, said pair of narrow armrests being non-detachably mounted to the frame of said seat assembly for movement between a use position in a generally vertical plane where they separate the seating positions in said first configuration and a stowed position in a generally horizontal plane in which they underlie the center back cushion portion in its generally horizontal armrest position and overlie the center seat bottom cushion in said second configuration.

4,533,176

BUILT-IN AUTOMATIC INFANT RESTRAINT SEAT

Bill Wyttenbach, Rte. 5, Wheeler Rd., WL #12, Louisville, Tenn. 37777

Filed Jul. 21, 1983, Ser. No. 516,208
Int. Cl.³ A47C *15/00*
U.S. Cl. 297—238 **12 Claims**



1. A vehicle seat for adults in combination with a foldaway infant protection and restraining seat, said combination seat comprising:

a seat member suitable for supporting an adult person in a moving vehicle including a support frame with a back portion secured to the structure of said vehicle, and a contact portion including a back contact portion having a front section and a rear section, said rear section secured to said back support frame for receiving and contacting the body of a seated person, and said front section of said contact portion being rotatably attached to one of said rear section and said back support frame including a section rotatable to between a first location and a second location;

a restraining means secured to said support frame; and

a child's seat movably secured to said support frame, said child's seat and restraining member movably cooperating with each other and said support frame and said rotatable section of said contact portion of said seat member to provide a first position wherein said child's seat and said restraining member are concealed between said front and rear section by said front rotatable section of said contact portion being in said first location and said seat member is suitable for occupancy by an adult, and said child's seat movable to a second position whereby wherein said front rotatable section of said contact portion is moved away from said rear section to in said second location and said child's seat is accessible and available for receiving and protecting use by a small child, and wherein said restraining means and said child's seat are suitable for restraining a child in said child's seat against substantial impact forces.

4,533,177

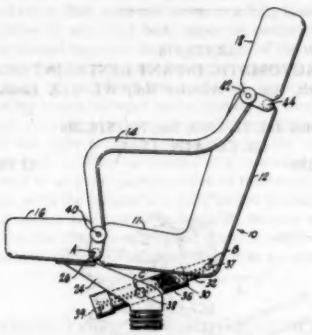
RECLINING CHAIR

Thomas L. Latone, Quakertown, Pa., assignor to Knoll International, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 046,010, Jun. 6, 1979, abandoned. This application May 21, 1980, Ser. No. 151,776
Int. Cl.³ A47C *3/00*
U.S. Cl. 297—301 **8 Claims**

1. A chair including a base portion, a seat portion connected pivotally at its forward end to said base portion and adapted to be reclined, and means including an arm compressible with progressive resistance for supporting a rear portion of said seat

portion, said arm having spaced-apart portions respectively connected pivotally to said rear portion and pivotally to said base portion to form with said seat portion an angle continually decreasing during reclining of said seat portion.



4,533,178

ECCENTRICALLY ROTATABLE CHAIR

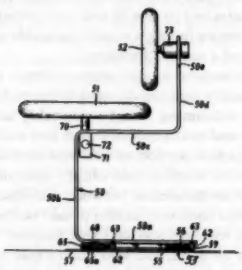
Harry R. de Polo, 480 Park Ave., New York, N.Y. 10021

Continuation-in-part of Ser. No. 95,450, Nov. 19, 1979, Pat. No. 4,400,032, Continuation-in-part of Ser. No. 893,685, Apr. 5, 1978, abandoned. This application Jan. 15, 1982, Ser. No. 339,466

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.³ A47C *3/18*

U.S. Cl. 297—349 **20 Claims**



1. An eccentrically rotatable chair comprising:

a base having a horizontal surface,

central support means fixed on said base and having a vertical axis,

an elongated non-extensible horizontal arm embracing and extending horizontally from from said central support means and having a longitudinal axis and an outer end spaced from said central support means, said horizontal arm being hollow and said central support means comprising a pivot post extending up into said hollow arm,

single roller support means at said outer end of said arm rollable in all directions on said base and supporting said outer end of said arm,

a seat disposed above and supported by said arm, and

means connecting said arm with said central support means for rotation of said arm about the vertical axis of said central support means and for movement of said arm as a whole longitudinally relative to said central support means while restraining vertical movement of said arm and rotation of said arm about its longitudinal axis, said central support means and roller support means supporting said arm and seat and any load on said seat.

4,533,179

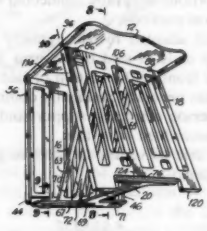
PORTABLE SEATING ASSEMBLY

James Nichols, Old Saybrook, Conn., and Franklyn M. Markus, 5725 Cote St. Luc, Hampstead, Quebec, Canada H3X 2E6, assignors to Franklyn M. Markus, Quebec, Canada

Filed May 20, 1983, Ser. No. 496,682

Int. Cl.³ A47C *7/00*

U.S. Cl. 297—440 **10 Claims**



1. A combination folding seat and table assembly, in combination, comprising:

a substantially flat first member including a top surface and an opposed undersurface and having at least one linear edge and an opposed end;

substantially flat second, third, fourth, and fifth supporting members;

said second member being rotatably connected to said first member at first coextensive linear edges;

said third member being rotatably connected to said second member at second coextensive linear edges;

said fourth member being rotatably connected to said third member at third coextensive linear edges; and

said fifth member being rotatably connected to said fourth member at fourth coextensive linear edges;

said linear edges being substantially parallel;

said assembly being movable between assembled and disassembled positions;

wherein in said assembled position;

said second member is upright with said second coextensive linear edges positioned closely spaced from a base surface and said first coextensive linear edges being positioned at an elevation, said second member having means for bearing against said base surface;

said third member is disposed angularly relative to said first member with said third coextensive linear edges positioned substantially at said elevation;

said fourth member extends between said third coextensive linear edges and said fourth coextensive linear edges, said fourth coextensive edges being positioned closely spaced from said base surface, said fourth member having means for bearing against said base surface;

said fifth member extends from said fourth coextensive linear edges closely spaced from said base surface to the bottom portion of said second member, said second and fifth members being detachably mounted at said bottom portion; and

said first member is detachably mounted on said third and fourth members at said third coextensive linear edges at said undersurface of said first member at a transverse position between said at least one linear edge and said opposed end, said first member being also detachably connected to said fourth member by detachable connecting means, and

wherein in said disassembled position said fourth and fifth members are detached from said second member, and said

first member is detached from said third and fourth members;

said first and second members are in mutual association,

said second and third members are in mutual association, and

said fifth member is in mutual association with said third and fourth members.

4,533,180

FLUID SUPPLY SYSTEM FOR ROTARY CUTTER HEADS FOR MINING EQUIPMENT AND TO MINING MACHINES COMPRISING ROTARY CUTTER HEADS HAVING FLUID SUPPLY SYSTEMS

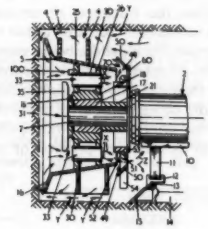
Albert G. French, Willington, England, and Brian A. Eagles, Johannesburg, South Africa, assignors to Coal Industry (Patents) Ltd., London, England

Continuation of Ser. No. 420,890, Sep. 21, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,181

Claims priority, application United Kingdom, Oct. 13, 1981, 8130809

Int. Cl.³ E21C *35/04*

U.S. Cl. 299—1 **1 Claim**



1. A mineral mining machine comprising a rotary cutter head having ventilating means including air flow passage means and a plurality of water nozzles fed by a water supply for directing air flow inducing water sprays into the vicinity of the air flow passage means, and sensor means located remote from the cutter head for sensing a preselected condition of the water supply fed to the plurality of nozzles during operation of the machine and for deriving a signal indicative of the sensed preselected condition, and means to de-activate the mining machine responsive to said signal should the water flow fall below a preselected volume.

4,533,181

METHOD FOR FORMING UNIFORM FLOW RUBBLE BED

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 484,378, Apr. 12, 1983, abandoned. This application Mar. 29, 1984, Ser. No. 594,833

Int. Cl.³ E21C *41/10*; E21B *43/247, 43/263*

U.S. Cl. 299—2 **57 Claims**

1. A method for recovering liquid and gaseous products from an in situ oil shale retort in a retort site in a subterranean formation containing oil shale, the in situ retort containing a fragmented permeable mass of formation particles within top, bottom, and four generally vertically extending side boundaries of unfragmented formation, the method comprising the steps of:

excavating at least one void in the subterranean formation within the boundaries of the retort site, while leaving at least one zone of unfragmented formation within the boundaries of the retort site having a generally horizontally extending free face adjacent the void;

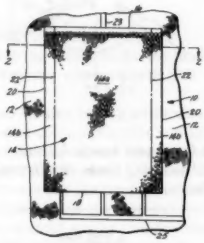
placing a plurality of horizontally spaced apart explosive charges in a selected pattern in such a zone of unfragmented formation, the selected pattern comprising:

an array of central explosive charges spaced apart from the side boundaries of the retort site, each of four outer rows of the array being about parallel to an adjacent retort side boundary; and

a plurality of perimeter explosive charges surrounding the central charges, the perimeter charges being in four rows with each of the rows adjacent one of the side boundaries, the spacing distance between each such row of perimeter charges and the adjacent outer row of central charges being about equal to the spacing distance between each other such row of perimeter charges and its respective adjacent outer row of central charges;

selecting a combination of spacing distance and powder factor for the central explosive charges for producing a center portion of the fragmented permeable mass having a first average particle size (d_1) and a first average void fraction (e_1);

selecting a powder factor for each row of perimeter charges and a spacing distance between each outer row of central



charges and the adjacent row of perimeter charges for producing a perimeter portion of the fragmented permeable mass having a second average particle size (d_2) different from the first average particle size (d_1) and a second average void fraction (e_2) different from the first average void fraction (e_1);

detonating the central and perimeter explosive charges for explosively expanding the zone of unfragmented formation toward the void to form the fragmented permeable mass of formation particles in the retort;

introducing an oxygen-supplying gas into the fragmented permeable mass, the second average particle size (d_2) and the second average void fraction (e_2) being related to the first average particle size (d_1) and the first average void fraction (e_1) so that the ratio of the superficial velocity (V_2) of such oxygen-supplying gas passing through the perimeter portion of the fragmented mass to the superficial velocity (V_1) of such oxygen-supplying gas passing through the center portion of the fragmented mass is from about 0.1 to about 6.0.

4,533,182

PROCESS FOR PRODUCTION OF OIL AND GAS THROUGH HORIZONTAL DRAINHOLES FROM UNDERGROUND WORKINGS

Walter L. Richards, Huntington Beach, Calif., assignor to Methane Drainage Ventures, Placentia, Calif.

Filed Aug. 3, 1984, Ser. No. 637,303

Int. Cl.³ E21B *43/14*; E21C *41/10*

U.S. Cl. 299—2 **21 Claims**

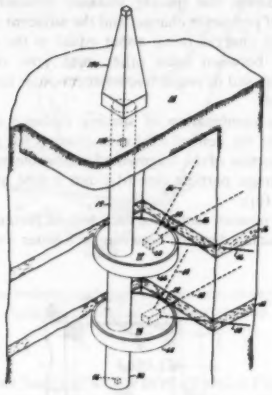
1. A method for collecting oil from a plurality of spaced-apart oil-bearing subterranean formations, said method comprising the steps of:

drilling a shaft from the earth's surface to a depth sufficient to intersect a plurality of spaced-apart oil-bearing subterranean formations;

excavating a working area at selected oil-bearing subterra-

nean formations with each said working area communicating with said shaft;

drilling a plurality of generally horizontal boreholes from each of said working areas into the selected oil-bearing subterranean formations; and,



collecting oil from said boreholes and conducting said oil through said working areas and through said shaft to the earth's surface.

4,533,183

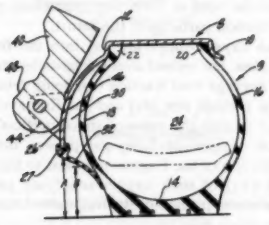
MILITARY WHEEL-TIRE ASSEMBLY

Lawrence A. Gant, Wayne, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 19, 1983, Ser. No. 533,078

Int. Cl.³ B60B *7/00, 15/06*

U.S. Cl. 301—37 TC **1 Claim**



1. In a wheel-tire assembly for a military vehicle; the wheel having inboard and outboard flanges; the tire comprising a tread wall, spaced side walls, and bead areas fitting within the wheel flanges: the improvement comprising an imperforate rigid armor wall extending from the outboard flange of the wheel alongside the associated side wall of the tire; said armor wall having an outer circular peripheral edge (27) spaced radially inwardly from the plane of the tire tread wall by a distance (A) that is slightly more than the expected radial deflection (B) of the tread wall during service on the road and over rough terrain, whereby the armor wall will at all times remain out of contact with the road or terrain surface; said armor wall being formed of armor material resistant to penetration by small arms fire, whereby said armor wall partially protects the tire from puncture due to enemy small arms fire; said armor wall diverging a significant distance away from the adjacent tire side wall in radial directions measured from the wheel outboard flange to the tire tread wall; the divergence of the armor wall from the tire side wall being sufficient to define a free space (30) sized to accommodate normal lateral flexure of the tire side wall during service operations, whereby the armor wall has no restraining action on tire flexure; an annular flexible sealing strip (32) having one peripheral edge thereof secured to the aforementioned peripheral edge of the armor wall, and another peripheral edge thereof adhesively secured to the tire side wall at a point near the tire tread wall; said sealing strip being effective to preclude entrance of debris into the free space used to accommodate flexure of the tire side wall; a series of circumferentially-spaced paddles carried by the armor wall for engagement with soft terrain to minimize tire slippage; each paddle being located on a radial line measured from the wheel rotational axis; means (42) swingably mounting each paddle for pivotal motion in a radial plane normal to the direction of tire motion, whereby each paddle is adjustable between a retracted position within the armor wall rotational envelope, and an extended position projecting radially beyond the armor wall rotational envelope; each paddle having a width dimension (C) normal to the tire radial cross section, and a thickness dimension (D) parallel to the tire rotational plane; the width dimension of each paddle being significantly greater than the thickness dimension whereby each paddle presents a substantial face area to the terrain after tire sinkage into the terrain; each paddle being swingable from its retracted position to its extended position through an arc that is slightly greater than one hundred eighty degrees; edge areas (48) of each paddle being contoured to forcibly engage outer surface areas of the armor wall for releasably retaining the respective paddle in its retracted position or its extended position.

4,533,184

DISC WHEEL WITH VENTILLATION PASSAGES

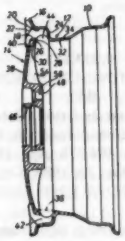
Alf Müller, Waiblingen; Hermann Schobbe, Fellbach; Bernd Löper, Korb, and Hartmut Binnewies, Wolfschlugen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,057

Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217458

Int. Cl.³ B60B *3/12, 3/04, 3/00*

U.S. Cl. 301—63 R **12 Claims**



1. A wheel for motor vehicles exhibiting in use a front face facing outwardly and a rear face facing inwardly of a vehicle, comprising:

a rim defining an interior wheel space for accommodating brake means and the like, said rim having an inner diameter deep bed wall-portion at the minimum diameter of the rim,

a wheel disk disposed adjacent to said rim to form an annular gap between said wheel disk and rim,

said wheel disk including a stiffening ring, and

radial connecting webs bridging the annular gap between said rim and said wheel disk, said connecting webs subdividing the annular gap into individual ventilation pas-

sages, said passages having exit apertures into the interior of the wheel,

wherein said ventilation passages extend radially from outside the wheel disk and stiffening ring to respective exit apertures opening to the interior wheel space,

wherein the wheel disk and stiffening ring exhibit a minimum diameter at the ventilation passages which is approximately equal to the inner diameter of the deep bed wall-portion of the rim, such that said exit apertures are not visible from the front face, and such that contaminating particles are inhibited from traveling through the ventilation passages to the front face of the wheel.

4,533,185

CONTROL SYSTEM FOR ELECTRO-PNEUMATIC COMPRESSED AIR BRAKES FOR RAIL VEHICLES

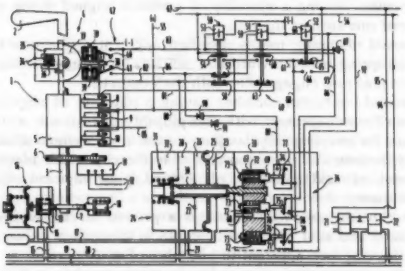
Friedrich Krause, Munich, Fed. Rep. of Germany, assignor to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,061

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1983, 3301097

Int. Cl.³ B60T *13/68*

U.S. Cl. 303—3 **13 Claims**



1. Control system for electropneumatic compressed air brakes for rail vehicles, with a manually operable servo valve (1) monitoring a pilot pressure for the control of a main air line pressure with a first electrical switching system (42) arranged at said servo valve (1) and having contacts (41) which close only during adjustment of said servo valve (1) in the release direction, for the control of an electrical relay system (49) having a holding system and monitoring the excitation of a brake and a release circuit (56 and 62), with a second electrical switching system (34) controllable by a piston (25) on which the pilot pressure acts against the main air line pressure for monitoring said relay system (49), and with solenoid valves (22) excitable by said release circuit (62) for control of the main air line pressure, said first switching system (42) having additional contacts (40) which close only upon adjustment of said servo valve (1) in the braking direction, said relay system (49), with its selection, having contacts (58, 63) which interrupt the circuits monitored by the contacts (40, 41) of said first switching system (42), contacts (77, 78) of said second switching system (34) enabling said holding system to be cut in and out.

4,533,186

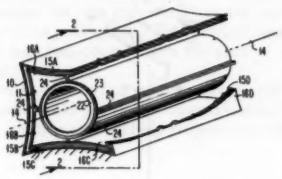
CYLINDRICAL TYPE SQUEEZE BEARING SYSTEMS WITH BEARING AND DRIVING ELEMENTS ATTACHED IN AREAS OF MAXIMUM DEFLECTION

Mats A. Engwall, Hollister, and Richard B. Mulvany, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,660

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—5 R **8 Claims**



1. A squeeze bearing system comprising:

a piezoelectric driving element having an operating frequency and antinodes when vibrating at said operating frequency;

a first bearing element also having antinodes at said operating frequency, said driving element and said first bearing element being coaxially nested about a longitudinal axis and spaced-apart radially about said axis, the radial spacing varying with angular position about said axis such that the configurations of said driving element and said first bearing element at cross sections perpendicular to said axis have substantially different geometric shapes;

a second bearing element coaxial with and radially spaced from said first bearing element; and

means, extending across the radial spacing between said driving element and said first bearing element at areas thereon determined by the location of said antinodes, for connecting said driving element to said first bearing element and for supporting said driving element and said first bearing element in their spaced-apart relationship, whereby when said driving element vibrates at said operating frequency said first bearing element changes its cross-sectional configuration cyclically to create a squeeze film between said first and second bearing elements.

4,533,187

DUAL BEAM CONNECTOR

Michael Kirkman, Barrington, R.I., assignor to Augat Inc., Mansfield, Mass.

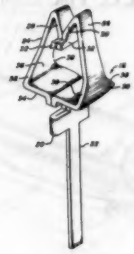
Filed Jan. 6, 1983, Ser. No. 455,945

Int. Cl.³ H01R *23/72*

U.S. Cl. 339—17 CF **1 Claim**

1. A connector for use with wave soldering, said connector having contacts with solder tabs on the leads thereof, which tabs are positioned above a printed circuit board, said printed circuit board having through-holes to accommodate said leads and to which said connector is mounted such that solder used to connect the leads to the board through-holes flows to the corresponding tabs for improved electrical contact between the connector contacts and respective printed circuit board through-holes, said connector including a housing which includes a number of sockets for receiving the pins of a mating connector, a number of contacts having coacting arms with flat portions for engaging opposite sides of said pins, said contacts being located in said sockets, each of said contacts having a lead which depends downwardly from the bottom surface of said housing, and a laterally running tab forming said solder tab, said laterally running tab being wider than the lead and folded on itself to form side by side tab portions in contact

with each other and with each said tab portion running in the same direction as that of the flat portions of the corresponding coacting arms, said laterally running tab extending from said lead below the bottom surface of said housing, said housing having standoffs depending from the bottom surface thereof, said standoffs spacing the bottom of said laterally running tabs from the corresponding through-holes so as to permit the



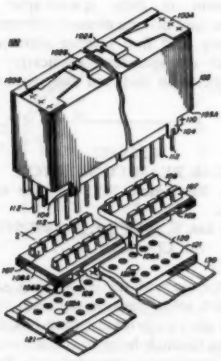
upflow of solder during wave soldering, such that when said connector is mounted to a printed circuit board having through-holes, the leads of said connector are inserted into corresponding through-holes, and with wave soldering, said connector leads are soldered to said printed circuit board, with solder extending through said through-holes and forming a solder bubble onto corresponding ones of said side by side tab portions of each laterally running tab.

4,533,188

HEADER AND HOUSING ASSEMBLY FOR ELECTRONIC CIRCUIT MODULES

Jay J. Miniet, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 15, 1983, Ser. No. 466,465
Int. Cl.[3] H01R *4/02*; H05K *1/00*
U.S. Cl. 339—17 CF **8 Claims**



1. A header and module assembly for holding an electronic circuit module having a sheet of substrate with at least one row of leads which project away from the module, said assembly comprising:

a header member having a plurality of apertures arranged in a row so that each aperture accepts one of said leads of the electronic circuit module;

a jaw means adjacent each aperture on said header member for receiving said leads and captivating the module to the header,

said leads dimensioned to project substantially beyond the apertures when said sheet of substrate is seated within said channel, thereby allowing a direct electrical connection to be made to the portion of the leads which extend beyond the apertures; and

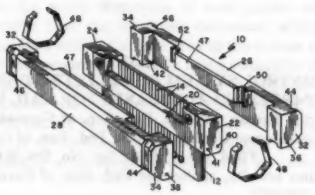
a flexible printed circuit board and a rigid interconnection board mounted to said flexible circuit board, said interconnection board having a plurality of apertures disposed to align with the corresponding apertures in said header member so that said leads of the electronic circuit module are received by the apertures in said interconnection board.

4,533,189

ZERO INSERTION FORCE CONNECTOR

Adelmo A. Scoccia, Upland, Calif., and Donald B. Schellin, deceased, late of Crestline, Calif. (by Gene Downes, administrator), assignors to General Dynamics Pomona Division, Pomona, Calif.

Filed Oct. 21, 1983, Ser. No. 544,157
Int. Cl.[3] H05K *1/00*; H01R *13/629*
U.S. Cl. 339—17 CF **9 Claims**



1. A zero force multiple pin electrical connector, said connector comprising:

a first connector member including a central planar support member having a plurality of contacts aligned along at least one surface thereof;

opposed clamping means disposed adjacent said contacts and spring-biased toward said contacts for biasing connector pins into engagement with the contacts;

a second connector member having a plurality of aligned pins for engagement with said plurality of contacts; and

means for enabling the clamping means to be wedged apart by the insertion of a separate tool to thereby enable placement of said plurality of aligned pins adjacent the contacts;

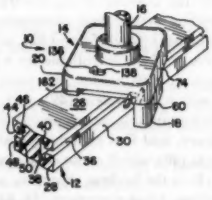
wherein said support member is a printed circuit wiring board and said plurality of contacts comprises contact strips disposed adjacent to one edge of said board.

4,533,190

ELECTRICAL POWER TRACK SYSTEM

Donald J. Booty, 521 Durham Dr., Frankfort, Ill. 60423

Filed Dec. 9, 1983, Ser. No. 559,902
Int. Cl.[3] H01R *25/14*
U.S. Cl. 339—21 R **21 Claims**



1. An electrical power track system comprising an elongated track defining a pair of generally opposite side surfaces, each of

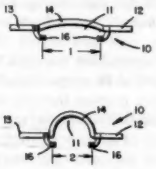
said side surfaces having at least one open slot extending longitudinally therealong, each of said slots providing access to at least one longitudinally extending electrical conductor positioned in offset relation to the corresponding slot, a gripper member including a gripper base having a channel therethrough enabling said gripper base to be mounted on said track in straddle fashion and be rotated relative to said track after mounting thereon in said straddle fashion such that surfaces defining said channel are disposed in generally confronting relation to said opposite track side surfaces, a pair of electrical contacts carried by said gripper base such that each contact extends outwardly from a corresponding one of said channel defining surfaces in a position to project into the corresponding slot when said gripper base is rotated so that said channel defining surfaces are in said generally confronting relation, and actuator means carried by said gripper base to cooperative association with said electrical contacts and being operative after said rotation of said gripper base to effect movement of said contacts so as to cause selective engagement of said contacts with said electrical conductors when said electrical contacts project into said slots.

4,533,191

IDC TERMINATION HAVING MEANS TO ADAPT TO VARIOUS CONDUCTOR SIZES

Harry P. Blackwood, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Nov. 21, 1983, Ser. No. 553,906
Int. Cl.³ H01R *29/00, 11/20, 43/04;* **H05K** *3/30*
U.S. Cl. 339—31 R **15 Claims**



1. An insulation displacement connector contact for electrically contacting a conductor by displacement of an insulating layer, said contact comprising a member including a slot having a desired width, said slot being defined by opposing legs of said member and a non-linear deformable web connecting said legs, wherein by deforming said web, it is possible to change said desired width of said slot to thereby adapt said contact to various conductor sizes and prongs supported by each of said legs at opposing sides of said slot for stabilizing the electrical connection between the contact and a shield of a coaxial cable by being adapted to be positioned within said shield.

4,533,192

INTEGRATED CIRCUIT TEST SOCKET

Lewis J. Kelley, Grapevine, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

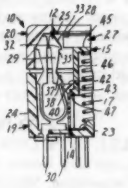
Filed Apr. 25, 1984, Ser. No. 603,616
Int. Cl.³ H01R *13/627, 13/635*
U.S. Cl. 339—45 M **10 Claims**

1. A test socket for integrated circuits in rectangular packages having contact pads or leads comprising:

an insulating body having a base wall, side walls and a top opening through which a said integrated circuit package may be inserted into said body,

a plurality of electrical contact elements in said body, one for each contact pad or lead to be test connected on a said integrated circuit package, each said contact element having a resilient contact leg extending in a direction from said base wall of said body toward said top opening and having its free end adjacent said top opening, each said contact leg being formed with an electrical contact portion and a latching projection adjacent its free end and extending generally perpendicular to the length of said leg toward the interior of said insulating body, said contact elements being mounted in said body such that when a said integrated circuit package is inserted into said top opening in said insulating body and pressed downward toward said body base wall its periphery contacts said contact element legs adjacent their free ends and forces them outwards until the base of said package passes said projections whereupon the resiliency of said legs causes them to move inward to bring said latching projections into contact latching positions over the outward facing surface of the package and said electrical contact portions of said legs into contact with the pads or leads on the package,

an unlatching cam in said insulating body, said unlatching cam having a rest position permitting said resilient contact legs to position said latching projections in their latching



positions and being movable toward said body base wall to an unlatching position to force said contact legs outward to move the latching projections outward beyond the periphery of the package,

an ejector member in said insulating body, said ejector member being formed with an integrated circuit package support surface that is accessible through said top opening in said body to receive and support a said integrated circuit package when said ejector member is in an unloaded position adjacent said top opening, said ejector member being movable from said unloaded position toward said body base wall to permit the package to be moved past said latching projections on said contact legs to cause the package to be latched into the test socket and being movable beyond the latched position to permit the package to contact said unlatching cam to move it toward said base wall to its unlatching position, and

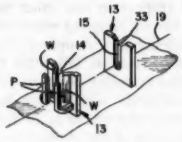
resilient means urging said ejector member toward its unloaded position.

4,533,193

IDC TERMINATION FOR COAXIAL CABLE HAVING ALIGNMENT & STABILIZING MEANS

Harry P. Blackwood, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Nov. 21, 1983, Ser. No. 553,833
Int. Cl.³ H01R *13/20, 11/20, 43/04;* **H05K** *3/30*
U.S. Cl. 339—65 **27 Claims**



1. A connector for a coaxial cable, said cable comprising: at least one central conductor defining a cable axis; at least one

surrounding conductive shield element; a first insulating layer arranged between said shield element and said central conductor; and an outer insulating jacket arranged about said shield element; said connector comprising two independent electrical contacts each of a different structural configuration for simultaneously establishing electrical connections to said central conductor and said conductive shield including:

first insulation displacement contact means having a first means for electrically contacting said shield element by displacement of said insulating jacket, said first contact means including a second means for stabilizing the electrical connection between said first contact means and said shield element by being adapted to be positioned within said shield element;

a second insulation displacement contact means for electrically contacting said central conductor by displacement of said insulating layer; and

contact support means comprising a base member for supporting said first and second contact means, said contact means being arranged on said base member along a contact axis with said second contact means following said first contact means and being electrically isolated therefrom whereby when said cable is connected to said first and second contact means said contact axis corresponds to said cable axis.

4,533,194

PUSH-PULL TYPE CONNECTING DEVICE

Philippe Boichut, and Guy Jeunet, both of Dole, France, assignors to Allied Corporation, Morris Township, Morris County, N.J.

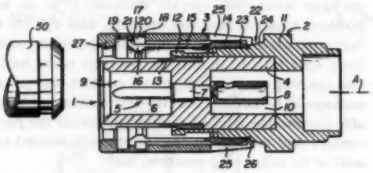
PCT No. PCT/FR82/00002, § 371 Date Sep. 7, 1982, § 102(e) Date Sep. 7, 1982

PCT Filed Jan. 6, 1982, Ser. No. 420,225

Claims priority, application France, Jan. 7, 1981, 81 00245

Int. Cl.³ H01R *13/627*

U.S. Cl. 339—91 R **19 Claims**



1. A "push-pull" connecting device, comprising first and second connectable connector elements, the said first connector element having a mechanical means designed to allow the coupling of the first and of the second connector elements and their locking in coupled position, said mechanical means comprising an outer cylindrical sleeve movable axially between a central locking position and two unlocked positions placed on both sides of the central position, an inner sleeve of cylindrical shape coaxial to the outer sleeve and provided with a series of small elastic tongues extending axially toward the coupling end of the said first connector element, said outer sleeve being movable with respect to said inner sleeve, each one of said small tongues having coupling members designed to cooperate with the complementary coupling elements provided on the second connector element, when the two connector elements are brought into coupling position, and an outer radial boss designed to cooperate with a cam surface arranged on the inside of the outer sleeve, so as to assure the locking and to allow the unlocking of the second connector element in relation to the first connector element, the outer sleeve also having a means for automatically returning it to its central locking position, characterized in that the means for returning the outer sleeve to its central locking position comprises a very wide V-shaped groove, this groove being placed in order to create two inclined ramps made up of the two walls of this groove, the width of the groove being at least equal to the travel of the movable outer sleeve, and spring means forming a crown at least partially around the inner sleeve and being urged by its elasticity toward its resting position, where it is lodged at the bottom of the V-shaped groove, and spring means being mounted between the inner sleeve and the outer sleeve in such a way that its position coincides with the locking position of the outer sleeve.

4,533,195

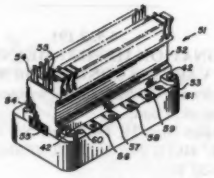
PRE-WIRED MODULAR CONNECTING BLOCKS

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Division of Ser. No. 937,043, Aug. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 815,270, Jul. 13, 1977, abandoned. This application Feb. 15, 1980, Ser. No. 122,017

Int. Cl.³ H01R *9/08*

U.S. Cl. 339—97 P **2 Claims**



1. A pre-wired modular connecting block comprising: a housing, said housing being formed from a dielectric material and including:

a body portion, said body portion having a shape of a parallelepiped, said body portion having a plurality of slots formed in a first planar surface portion thereof, said slots extending part way through said body portion, said body portion further having a plurality of apertures extending inwardly from a second face thereof disposed oppositely to said first face portion, said apertures communicating with said slots and being arranged in rows and columns;

a rim portion integral with and extending from said body portion second face, said rim portion defining an edge extending at least part way around at least a portion of said body portion second face, said rim portion and b dy portion second face cooperating to define a recessed area; and

a plurality of apertured securing protusions extending outwardly from said rim portion, said apertures in said protusions having axes which are generally parallel with said body portion apertures;

a plurality of insulation piercing electrically conductive contact members, said contact members being disposed in at least some of said slots in said housing body portion, said contact members each including:

a flat support portion having a pair of oppositely disposed edges;

at least one pair of oppositely disposed contact fingers projecting upwardly from and being integral with a first edge of said support portion; and

a tang of rectangular cross-section extending from the said second edge of said support portion, said tang being co-planar with said support portion and extending through one of said apertures into the said recessed area, said tang being engaged by said housing body portion to thereby retain the contact element in said housing with said fingers extending above the said first face portion of said housing body portion; and

wherein said contact member tangs extend outwardly beyond a plate defined by said housing rim portion;

base means, said base means being formed from a dielectric material, said base means having a pair of oppositely dis-

posed flat mounting surfaces which lie in parallel planes, said base means being provided with apertures extending therethrough between said mounting surfaces, said apertures being spaced apart by the same distance as said apertures in said housing securing protusions whereby said base means may be mounted on a support surface with a first mounting surface in abutting contact therewith and said housing may be mounted on said base means with said rim portion in contact with said second mounting surface, said base means when said housing is mounted thereon cooperating with said rim portion and body portion second face to define a cavity between said housing and said base means;

and wherein said base means is provided with a recess bounded by said second mounting surface, said recess forming part of said cavity and said tangs extending into said recess, and

wherein said base means recess is sub-divided by a plurality of parallel walls, said walls serving to prevent lateral movement of said tangs,

means removably securing said housing to said base means; and

circuit means disposed in part in said cavity and connected to said contact member tangs for electrically interconnecting said contact members in preselected groups, said circuit means including a plurality of conductors equal in number to said groups of contact members, said conductors extending outwardly from said cavity in a direction generally transverse to the axes of said securing protusion apertures so as to be available to the exterior of said connecting block.

4,533,196

DEVICE FOR MAKING A SOLDERLESS, NON-SCREWED AND UNSTRIPPED SINGLE OR MULTIPLE CONTACT AT A TERMINAL ELEMENT

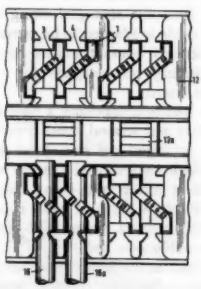
Horst Forberg; Klaus-Peter Achtnig; Gunter Hegner, and Gerhard Boes, all of Berlin, Fed. Rep. of Germany, assignors to KRONE GmbH, Berlin, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,370

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137429

Int. Cl.³ H01R *9/08*

U.S. Cl. 339—97 P **3 Claims**



1. A terminal element adapted to be mounted in a terminal strip, said terminal strip having the capability of retaining a plurality of said terminal elements, said terminal element comprising:

at least one pair of contacts made of resilient contact material, each said contact having a vertically extending slot with an open upper end for solderless, non-screwed and unstripped termination of at least one wire having insulation;

each said contact including a transverse web containing said slot and disposed at approximately 45° to the axis of the wire inserted in said slot, each said slot being defined by sharp edges and having a width which, due to the inclined orientation between said inserted wire and said contact, is smaller than the size of the metal core of the inserted wire so that when said wire is inserted in said slot, the wire insulation is severed by said sharp edges and electrical contact is made between said wire and said contact;

said transverse webs of said at lest one pair of contacts being in parallel relationship, each said contact having front and rear web portions extending from the respective ends of said transverse web, the front portion of one of said contacts and the rear portion of the other of said contacts being disposed in colinear relationship whereby the axial spacing of a pair of wires inserted into said slots of said pair of contacts is limited only by the wall thickness of said front and rear portions of said contacts;

said front and rear web portions including a horizontally extending portion disposed above said respective slot upper end opening in overlying, spaced-apart relationship therewith for guiding the wire as it is inserted into said slot; and

a connecting member below said slots at the lower end of said contacts for interconnecting said contacts.

4,533,197

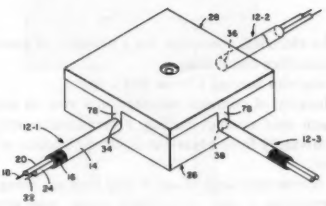
JUNCTION BLOCK FOR SHIELDED COMMUNICATIONS NETWORK LINE

Thomas F. Prince, 1175 Brook Rd., Milton, Mass. 02186, and Julian J. Bishop, 31 Beech St., Belmont, Mass. 02188

Filed May 18, 1983, Ser. No. 495,831

Int. Cl.³ H01R *4/02*

U.S. Cl. 339—97 R **12 Claims**



9. A junction block for providing connections among a plurality of lines, each line comprising an outer insulating sheath, a conductive shield of predetermined diameter thereunder, and a plurality of conductors therein each separately enclosed in an insulating layer, said junction block comprising

a base and a cover mutually engageable to define in an assembled condition a junction block body enclosing an interior space with a floor provided by the base, a top provided by the cover, and a perimeter wall provided cooperatively by the base and cover,

said base including

a shield bus made from a single piece of sheet metal stock and providing a shield bus wall positioned at right angles to said floor, an edge of said shield bus wall away from said floor having therein a plurality of insulation displacement slots sized to displace the outer insulating sheath of a line and make contact with the conductive shield thereunder,

one or more conductor buses, electrically isolated from said shield bus and each other if more than one, each made from a single piece of sheet metal stock and providing a conductor bus wall positioned within said interior space at right angles to said floor, an edge of each said conductor bus wall away from said floor having therein a plurality of insulation displacement slots sized to displace the outer insulating sheath of a conductor and make contact with the conductor therein,

said block in assembled condition providing a plurality of line entrance structures providing passage for a line through said perimeter wall while holding said line in place, said structures being sized to fit the outer insulating

sheath and being aligned respectively to the plurality of insulation displacement slots in said shield bus.

4,533,198

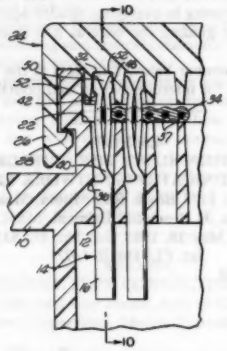
INSULATION DISPLACEMENT CONNECTOR

John W. Anhalt, Orange, Calif., assignor to International Telephone & Telegraph Corp., New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,235

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—99 R **14 Claims**



1. An electrical connector for a plurality of generally parallel conductors comprising:

an insulator having a front and a rear;

a plurality of contacts mounted in a row in said insulator, each said contact having a termination end extending outwardly from a rearwardly facing surface of said insulator;

the termination end of each said contact being bifurcated providing a pair of resilient arms, said arms of each contact being bent in opposite directions away from a plane extending transversely of said row providing therebetween a slot for reception of a respective conductor when the plurality of conductors is positioned transverse of said row and the conductors are pushed downwardly over the rear of said insulator;

said arms of each said contact having forward stationary portions and rear free end portions movable relative to said transverse plane therebetween, and intermediate conductor engaging portions;

a cap adapted to be mounted on the rear of said insulator;

said cap having a row of recesses therein spaced to receive therein said free end portions of said arms of the respective contacts when said cap is mounted on the rear of said insulator; and

each said recess embodying means for restricting the free end portions of the arms of the contact therein from moving outwardly away from said plane whereby when a conductor extending transversely of said row is pushed between said arms to said intermediate portions and said cap is mounted on said rear of said insulator, said intermediate portions of said arms will become bowed around said conductor so that said arms will produce a resilient engaging force against the opposite sides of the conductor;

the slot in each contact has substantially zero width as viewed along the axis of the conductor immediately prior to reception of the conductor into the slot, and said means for restricting the free end portions of the arms holds said free end portions sufficiently close so they remain at substantially their original spacing and the middle portions of said arms are bowed around said conductor.

4,533,199

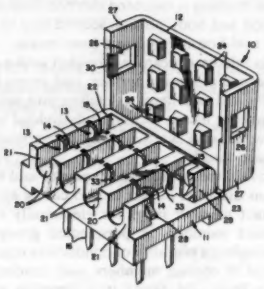
IDC TERMINATION FOR COAXIAL CABLE

Leonard Feldberg, Spring Valley, N.Y., assignor to Burndy Corporation, Norwalk, Conn.

Filed Nov. 14, 1983, Ser. No. 551,771

Int. Cl.³ H01R *11/20, 43/04;* H05K *3/30*

U.S. Cl. 339—99 R **6 Claims**



1. A connector for a coaxial cable, said cable comprising: at least one central conductor defining a cable axis; at least one surrounding conductive shield element; a first insulating layer arranged between said shield element and said central conductor; and an outer insulating jacket arranged about said shield element; said connector comprising:

first insulation displacement contact means for electrically contacting said shield element by displacement of said insulating jacket;

second insulation displacement contact means for electrically contacting said central conductor by displacement of said insulating layer;

said first contact means comprising a member including a first slot having a first width and wherein said second contact means comprises a member having a second slot having a second width narrower than said first width and wherein said slots are arranged along said contact axis whereby said cable is adapted to be pressed into said slots;

said first and second contact means having blade metal members including pin-positions for connection to a printed circuit board;

contact support means comprising a base member for supporting said first and second contact means, said contact means being arranged on said base member along a contact axis with said second contact means following said first contact means and being electrically isolated therefrom, whereby when said cable is connected to said first and second contact means said contact axis corresponds to said cable axis; and

a cover member and means for locking said cover member to said base member, the cover member being hinged to said base member to pivot between an open position for inserting said coaxial cable and a closed portion for locking said coaxial cable in place and wherein said cover member includes anvil portions for engaging said cable when said cover member is closed.

4,533,200

STACKABLE ELECTRICAL CONNECTOR

Albert H. Wilson, Los Angeles, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jun. 23, 1982, Ser. No. 391,211

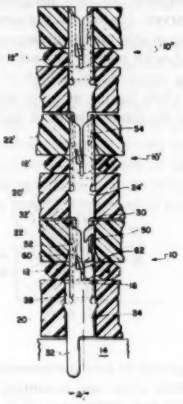
Int. Cl.³ H01R *4/02*

U.S. Cl. 339—99 R **12 Claims**

1. An electrical connector for insulated conductor cable comprising:

a housing;

a contact mounted in said housing, said contact including a socket portion opening exteriorly of said housing, and an insertion portion extending exteriorly of a surface of said housing; said socket portion having a receiving slot in-



cluding means for electrically engaging said contact to a conductor of said cable

said socket defining a chamber in communication with said slot, tapering toward said inserting portion, said chamber adapted to receive a conductive element therein.

4,533,201

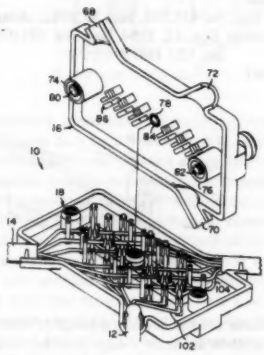
BRIDGE TAP

Henry G. Wasserlein, Jr., Seminole, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 5, 1984, Ser. No. 596,972

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—99 R **14 Claims**



1. A bridge tap connector for joining a multiconductor tap cable to a multiconductor continuous run cable, said bridge tap connector comprising:

a pair of mating bottom and top covers of rigid insulative material, said covers together defining a cavity therebetween,

a plurality of terminals fixed in said bottom cover, each terminal having first and second flanges extending normal to each other and to the plane of said bottom cover into said cavity, each said first and second flange having an insulation-piercing, conductor-engaging slotted profile,

a plurality of pairs of conductor gripping members, the members of each pair being integral with said bottom cover and spaced on opposite sides of a respective first or second flange aligned with the slotted profile thereof,

a plurality of conductor stuffer members integral with said top cover and extending integrally therefrom into said cavity, each said conductor stuffer member being aligned with a respective terminal and adapted to drive conductors of said tap and continuous run cables into said slotted profiles, and

means to secure said covers together.

4,533,202

MULTIPLE ELECTRICAL CONNECTOR AND BLOCK WITH PRINTED CIRCUIT BOARD CONNECTOR CLIP

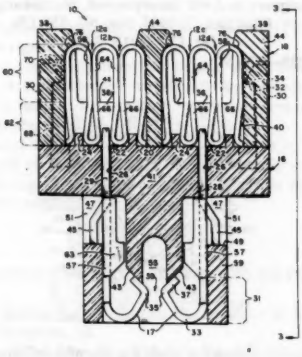
Karl-Heinz Pohl, Buffalo, Minn., assignor to The Siemon Company, Watertown, Conn.

Filed Sep. 29, 1983, Ser. No. 537,069

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—176 MP **15 Claims**



1. A block for housing electrically conductive wire-formed connector elements of the type having oppositely facing and interconnected upper and low rows of loops, the block including:

a retainer section, said retainer section having opposite first and second surfaces;

a plurality of rows of spaced slots in said retainer section first surface;

at least some of said spaced slots of said retainer section being provided with apertures and spacers, said apertures and said spacers each being positioned so as to be equidistant from the centers of an adjacent pair or loops of a connector element, said apertures communicating with said retainer section second surface, each of said spacers being a protrusion which will be positioned between and in contact with two adjacent lower loops of a connector element;

at least a pair of elongated electrically conductive printed circuit board connector pin means, said pin means being positioned and retained within said apertures of said spaced slots, a first end of said pin means extending outwardly beyond said first surface of said retainer section wherein said extended pin means first end is capable of being positioned between and in electrical contact with two adjacent lower loops of a connector element, a second end of said pin means having incorporated thereon a printed circuit board receiving means, a pair of said receiving means capable of electrical and mechanical connection and defining a printed circuit board connector clip;

a main body section;

a plurality of rows of spaced slots in said main body section in alignment with corresponding rows of slots in said retainer section;

a plurality of bridge elements on said main body section in bridging alignment with the slots in each row of said main body section, each bridge element defining a passage in alignment with corresponding slots in the main body section and the retainer section;

said corresponding retainer slots, main body slots and bridge passages in each main body section cooperating to define housings for electrically conductive wire connector elements;

said bridge elements in each row being spaced apart and in alignment with bridge elements in other rows to define spaced columns for connection of electrical conductors to wire connector elements; and

means for releasably joining said retainer section and said main body section together.

4,533,203

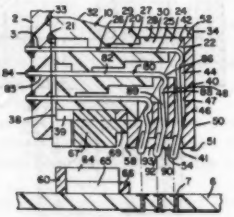
CONNECTOR FOR PRINTED CIRCUIT BOARDS

Steven Feldman, Seminole, and Richard J. Cihak, Largo, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 7, 1983, Ser. No. 559,129

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—176 M **5 Claims**



1. Electrical connector having a plurality of elongate right angle spring metal contact elements mounted in at least one row of respective passages through a housing, said housing having a first portion with a first outside face and a second portion with a second outside face, said second outside face being substantially perpendicular to said first mating face, said passage having a first portion opening on said first face and a second portion opening on said second face, said elements each having a first arm in a respective first portion of passage, a second arm in a respective second portion of passage, and a substantially right angle bend between said arms, said arms having respective first and second ends remote from said bend, said connector being characterized in that each said first arm is fixed against lateral movement at a fixing point in said first portion of said passage remote from said bend, each said passage between said fixing point and said bend being enlarged so that said first arm between said fixing point and said bend is free to deflect away from said second face when said second arm is moved axially in said second portion of passage away from said second face, whereby said second ends will comply resiliently with contacts brought to bear thereagainst.

4,533,204

RESILIENT CIRCUIT BOARD CONTACT

Eugene E. Moynagh, Jr., Afton, and Donald J. Jansky, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

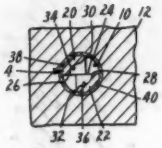
Filed Aug. 23, 1982, Ser. No. 410,321

Int. Cl.³ H01R *4/24*

U.S. Cl. 339—221 R **2 Claims**

1. A resilient contact including a mounting portion adapted for insertion into and engagement with a circular hole formed in a circuit board, said mounting portion having a longitudinal axis coincident with the axis of said circular hole when said mounting portion is inserted into said hole and comprising:

a thin spline having two major surfaces parallel to said longitudinal axis and a generally rectangular cross-section in a plane perpendicular to said longitudinal axis and two oppositely curved blades, each extending laterally outward from one of said major surfaces and being symmetrically disposed with respect to said longitudinal axis, the blades having inner edges which slide relative to one another each blade having an outer surface with an essentially constant maximum radius in said plane perpendicular to said longitudinal axis corresponding to the radius of said circular hole when said mounting portion is inserted into said circular hole and an essentially constant thickness substantially equal to the thickness of said spline so that said blades define substantially 90 degree sectors of a tubular cylinder in said plane perpendicular to said longitudinal axis, said outer radius of each of said blades decreasing in both longitudinal directions from said maximum radius so that said blades join said spline at opposite longitudinal ends to longitudinally bow said blades and facilitate insertion and removal of said mounting portion with respect to said circular hole.



4,533,205

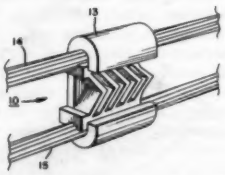
COLLAPSIBLE WEDGE FOR ELECTRICAL CONNECTOR

Walter Frank, Darien, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 431,916, Sep. 30, 1982, abandoned. This application Dec. 12, 1984, Ser. No. 681,075

Int. Cl.³ H01R *13/24*

U.S. Cl. 339—247 **11 Claims**

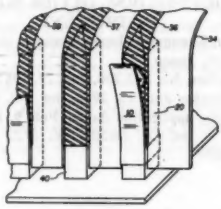


1. A wedge connector for holding a range of sizes of electrical conductors betwen an inner wedge member and a mating outer shell member, comprising: A wedge-shaped outer shell member having a generally "C" shaped cross-section forming a pair of diverging opposed inner contact surfaces for receiving a pair of electrical conductors and a mating wedge member therein; and a wedge member having a small end and a large end with a given length therebetween, said wedge member further comprising:

(a) A pair of diverging contact portions each extending in the lengthwise direction of said wedge from the small end to the large end, and each having a contact surface thereon for holding conductors against the outer shell member upon insertion of the wedge into the shell;

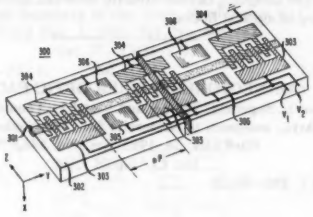
(b) a plurality of discrete ribs extending between the contact portions, spaced from each other in the lengthwise direction of said wedge, and each having a lengthwise dimension less than said given length;
(c) a first one of said ribs being located proximate the small end of said wedge and a second one of said ribs being located proximate the large end;
(d) each of said ribs having an offset between said contact portions which is displaceable in the lengthwise direction of said wedge, as said ribs are forced to collapse; and
(e) said ribs collapsing as said contact portions are displaced toward each other upon insertion of said wedge member into said outer shell member, thereby decreasing the spacing between the contact surfaces of said wedge so as to accommodate conductors of increasing size between said wedge member and said outer shell member.

4,533,206
FLEXIBLE PRINTED CIRCUIT CONNECTOR
Anthony J. Wilkis, Downers Grove, Ill., assignor to Rockwell International Corp., El Segundo, Calif.
Continuation of Ser. No. 373,574, Apr. 30, 1982, abandoned. This application Jun. 12, 1984, Ser. No. 619,867
Int. Cl.³ H01R *13/12*
U.S. Cl. 339—258 R **4 Claims**



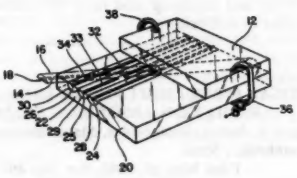
1. An electrical connector for mating a conductor path of flat flexible cable to a rigid terminal post, comprising:
a conductive base means having a longitudinal access with a rectangular cross-sectional shape substantially the same as the cross-sectional shape of said terminal post and four sides having a uniform longitudinal dimension and a gap extending along the entire longitudinal length of one side and circumferentially sized to provide a tight sliding fit over said terminal post, whereby electrical contact between said base means and said base post is established;
a conductive elongated finger resiliently fixed to said base means and extending from said base means in a direction generally parallel to said longitudinal access;
contact means connected to said finger and extending in a direction toward said base means longitudinal access in an amount sufficient to cause said finger to be deflected by terminal post surface making contact with the contact means when the terminal post is inserted into said connector and having a width substantially equal to said base means and said finger;
whereby, upon sandwiching said flat flexible cable conductor path between said terminal post and said contact means, an electrical connection is effected between said terminal post and said conductor path.

4,533,207
WAVELENGTH TUNABLE TE TO TM MODE CONVERTER
Rodney C. Alferness, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jun. 21, 1983, Ser. No. 506,456
Int. Cl.³ G02B *5/14*
U.S. Cl. 350—96.14 **8 Claims**



1. A wavelength tunable TE to TM optical mode converter comprising
a birefringent waveguide capable of guiding TE and TM optical signal modes;
means for converting from one of said signal modes to the other at a preselected wavelength by providing a first electric field in first spatially separated regions of said waveguide; and
means for shifting said preselected wavelength by providing a second electric field which is substantially confined to second regions of said waveguide which do not overlap said first regions.

4,533,208
EVANESCENT-WAVE STAR COUPLER ON A SUBSTRATE
David W. Stowe, Buffalo Grove, Ill., assignor to Gould Inc., Rolling Meadows, Ill.
Filed Mar. 21, 1983, Ser. No. 477,178
Int. Cl.³ G08C *19/00*
U.S. Cl. 350—96.16 **6 Claims**



1. A star coupler for coupling light from a single source to a plurality of output ports, comprising:
a first rigid substrate;
a first optical fiber having an outer cladding and an inner core, a portion of said cladding forming a molecular interface with said first rigid substrate to maintain said first fiber in a fixed spatial relationship with said first substrate;
a second rigid substrate;
a plurality of optical fibers, each of said plurality of optical fibers having an outer cladding, an inner core, and an output port, a portion of said cladding of each of said plurality of optical fibers forming a molecular interface with said second rigid substrate to maintain said plurality of optical fibers in a fixed spatial relationship with said second substrate, said first optical fiber and said plurality of optical fibers each having an exposed core zone; and

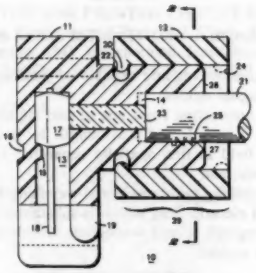
maintaining means for maintaining said first and second substrates in juxtaposition with one another to maintain said exposed core zone of said first optical fiber in nonparallel juxtaposition with said exposed core zone of said plurality of optical fibers, whereby light from said first fiber may be evanescently coupled into said plurality of optical fibers in said exposed core zone of said plurality of optical fibers, said plurality of optical fibers spaced a predetermined distance from another such that no evanescent coupling occurs directly between any of said plurality of optical fibers.

4,533,209

CONNECTORLESS FIBER OPTIC PACKAGE

Eugene E. Segerson, Tempe, and Floyd L. Thomas, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 24, 1983, Ser. No. 544,679
Int. Cl.³ G02B *7/26*
U.S. Cl. 350—96.20 **13 Claims**



1. An article comprising:

a body of plastic material defining first and second chambers, the first of said chambers being adapted to receive an electro-optical device and the second of said chambers being adapted to receive the end of an optical fiber;

said first and second chambers being aligned so that the axis of the second chamber intersects the first chamber;

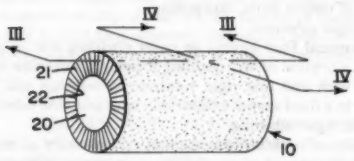
collar means surrounding at least a portion of said second chamber, said collar means being rotatable about said body and engaging said body for securing said optical fiber to said body.

4,533,210

OPTICAL FIBER LIGHT FILTER USING ELONGATED RADIATION ABSORBING ELEMENTS

Richard V. Jeskey, Southbridge, Mass., assignor to Incom, Inc., Southbridge, Mass.

Filed May 24, 1983, Ser. No. 497,665
Int. Cl.³ G02B *5/172*
U.S. Cl. 350—96.30 **12 Claims**



1. Off-axis radiation filter in the form of a faceplate for an optical device, comprising:

(a) a solid, cylindrical core which is transparent to at least a chosen band of radiation, the core having well-defined axis coincident with the central line-of-sight of the device,

(b) a layer of cladding having essentially the same index of refraction as the core, the cladding being attached to the core at an interface which is non-reflecting and non-refracting, said interface being parallel to the axis of the core, and

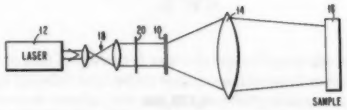
(c) a plurality of discrete, elongated, radiation absorbing elements embedded in the cladding, said elements extending from the core in a direction generally normal to the interface between the core and the cladding.

4,533,211

FREQUENCY MULTIPLEXED OPTICAL SPATIAL FILTER BASED UPON PHOTOCHEMICAL HOLE BURNING

Gary C. Bjorklund, Los Altos, and Glenn T. Sincerbox, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 31, 1983, Ser. No. 462,724
Int. Cl.³ G01N *21/25*; G06G *9/00*
U.S. Cl. 350—162.12 **9 Claims**



1. A frequency multiplexed optical spatial filter comprising:

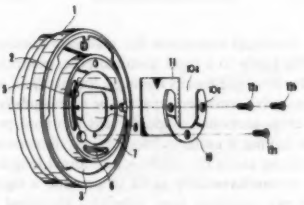
a plurality of images stored in a photochemical hole burning storage medium, said images formed at different optical frequencies and co-existing in the same volume of said medium.

4,533,212

ACCESSORY HOLDING DEVICE FOR OPTICAL INSTRUMENT

Seiichi Shimizu, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 342,206, Jan. 25, 1982, abandoned. This application Jun. 22, 1984, Ser. No. 623,538
Claims priority, application Japan, Feb. 9, 1981, 56-16984[U]
Int. Cl.³ G02B *7/00, 5/22*
U.S. Cl. 350—318 **4 Claims**



1. An interchangeable lens assembly having a barrel adapted to have a filter element attached thereto comprising:

a lens barrel member having coupling means for engaging with complementary coupling means on a camera to mount said lens assembly on said camera by rotation of said lens barrel member relative to said camera;

a mount member rotatable relative to said lens barrel member and adapted to be held in nonrotative engagement with said camera when said coupling means are engaged with the complementary coupling means of said camera by rotating said lens barrel member to mount said lens assembly on said camera;

a sleeve portion on said mount member extending along the optical axis of said lens assembly in a direction toward said

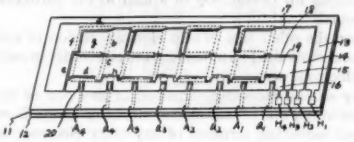
camera when said lens assembly is mounted thereon; and a filter holding member mounted on said sleeve portion having a cutout portion forming a gap together with said sleeve portion into which a filter may be inserted for fixture on said lens assembly.

4,533,213

LIQUID CRYSTAL DISPLAY

Isamu Washizuka, Soraku, and Yoshio Takeda, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 582,179, May 30, 1975, abandoned. This application Jan. 17, 1978, Ser. No. 870,210
Claims priority, application Japan, May 31, 1974, 49-62088
Int. Cl.³ G02F 1/133
U.S. Cl. 350—332 **8 Claims**



1. A driving circuit for driving a liquid crystal display panel including two groups of segment electrodes provided at respective digit positions, four reflection electrodes continuously provided in common to the respective digit positions, thin gaps provided between adjacent reflection electrodes along the longitudinal edge of the liquid crystal display panel, and a liquid crystal composition filled between the segment electrodes and the reflection electrodes, comprising:

a. a register for storing numeral information to be displayed;

b. a binary counter for generating two timing signals;

c. a decoder for converting the numeral information into segment selection control signals to be applied to the segment electrodes in synchronization with the two timing signals; and

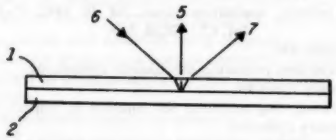
d. a quaternary counter for generating reflection electrode selection signals to be applied to the reflection electrodes in synchronization with the two timing signals.

4,533,214

BIAXIAL SUBSTRATES IN LIGHT MODULATING DEVICES

Perry A. Penz, Richardson, Tex.; Robert J. Petcavich, Carbondale, Pa.; William P. Stearns, Richardson, and Larry W. Sanders, Wylie, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 304,134, Sep. 21, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,574
Int. Cl.³ G02F 1/13
U.S. Cl. 350—334 **11 Claims**



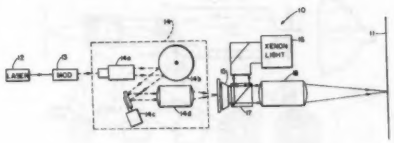
1. A light-modulating device structure comprising a light-modulating means having a substrate of anisotropic biaxial material, said biaxial material characterized by the angles between the normal to said substrate and each of its two optic axes being greater than the angles in said material between said normal and the light rays of interest being modulated by said means.

4,533,215

REAL-TIME ULTRA-HIGH RESOLUTION IMAGE PROJECTION DISPLAY USING LASER-ADDRESSED LIQUID CRYSTAL LIGHT VALVE

John A. Trias, La Mesa, and John Marez, San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1982, Ser. No. 446,292
Int. Cl.³ G02F 1/13
U.S. Cl. 350—347 E **1 Claim**



1. An apparatus for displaying real-time ultra-high resolution projected images on a distant screen at video scan rates comprising:

a laser directing a beam to a modulator for providing a modulated beam of coherent light;

a beam expander disposed to receive the modulated coherent light beam, an X-scanner and a Y-scanner receiving the expanded modulated coherent light beam and a field flattening lens orientated to receive the X and Y scanned expanded modulated coherent light beam disposed to receive the modulated coherent light beam for imparting a vertical and horizontal scanning thereof;

a nematic field effect liquid crystal light valve aligned to receive the scanned modulated coherent light beam for selectively changing its birefringence effect to modulate polarized light in direct response to the voltage pattern directly produced by photoactivation therein by the modulated coherent light beam;

a light source disposed for projecting a high intensity light beam in a light path to the nematic liquid crystal light valve; and

a polarized beam splitter interposed in the light path between the nematic liquid crystal light valve and the high intensity light beam source for polarizing and reflecting high intensity polarized light onto the nematic liquid crystal light valve and for directing reflected modulated polarized high intensity light modulated in accordance with the modulated coherent light beam onto the distant screen in the form of the real-time high-resolution images at video scan rates.

4,533,216

LIGHT VALVE PROJECTION SYSTEM WITH IMPROVED WRITING CONTROL AND REDUCED FLUID DEGRADATION

David A. Orser, North Syracuse, and Jeffrey A. Bulow, Syracuse, both of N.Y., assignors to General Electric Company, Portsmouth, Va.

Filed Jun. 13, 1983, Ser. No. 503,441
Int. Cl.³ G02B 5/20; H04N 5/74
U.S. Cl. 350—361 **8 Claims**

1. An improved light valve comprising:

a light modulating fluid;

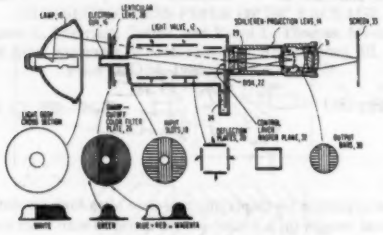
a light source positioned to project light through said light modulating fluid;

electron beam means for scanning an electron beam to form a raster, wherein there is formed within said raster at least one diffraction grating in said light modulating fluid to

diffract incident light from said light source for projection onto a viewing surface,

said electron beam means including vertical and horizontal deflection means for controlling the position of said electron beam and means for depositing charge to control depth and spacing of grooves in said diffraction grating thereby controlling the diffraction of said incident light, and

a sharp-cutoff filter positioned between said light source and said light modulating fluid, said sharp-cutoff filter being an optical filer having characteristics where below a specified wavelength the transmissivity is near zero percent



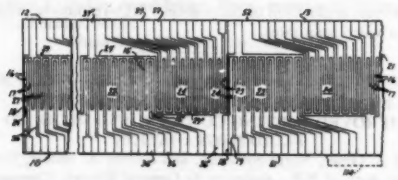
over a desirable range of the electromagnetic spectrum, including at least that part of the ultraviolet spectrum responsible for deleterious effects on the light modulating fluid, and near 100% over a range of the electromagnetic spectrum which is used for information imaging with the transition from near zero percent to near 100% transmission being defined by a steep positive going slope, said sharp-cutoff filter allowing the operation of the light valve at high brightness levels while reducing attendant degradation effects of said light modulating fluid and maintaining desired writing parameters of the light valve by decreasing the temperature of said light modulating fluid for said high brightness levels.

4,533,217

LIGHT GATE ASSEMBLIES, ELEMENTS AND MANUFACTURING METHODS

Norbert E. Samek, Sierra Madre, Calif., assignor to Transamerica Delaval Inc., Lawrenceville, N.J.

Division of Ser. No. 34,894, Apr. 30, 1979, Pat. No. 4,478,495.
This application Aug. 9, 1982, Ser. No. 423,496
Int. Cl.³ G02F 1/03
U.S. Cl. 350—392 **31 Claims**



1. In a method of composing an elongate light gate structure of a plurality of individual chips of electrooptically active light gate material displaying field induced birefringence, the improvement comprising in combination the steps of:

providing said chips in rectangular configuration having parallel first and second sides and parallel edges extending between said sides;

providing on each chip a plurality of alternating electrodes and elongate light gate regions extending parallel to said first and second sides of the rectangular configuration;

subdividing the spaced parallel electrodes on each chip into complete first and second electrode arrays alternating with each other along an elongate region of said chip;

allocating to each of said electrode arrays a plurality of said electrodes;

providing on one side of said elongate region of said chip first individual terminals for the electrodes in each first electrode array;

spacing any first individual terminal of any one of the electrodes in any of said first electrode arrays from the first individual terminal of any other electrode in the particular first electrode array by a center-to-center distance greater than the center-to-center spacing between said one electrode and said other electrode, while arranging said first individual terminals side by side along one of said parallel edges to provide each first individual terminal with an individual connecting lead path being free of any other terminal and intersecting a plane through said one of said parallel edges for connection of a lead to the particular first terminal;

providing on the other side of said elongate region of said chip second individual terminals for the electrodes in each second electrode array;

spacing any second individual terminal of any one of the electrodes in any one of said second electrode arrays from the second individual terminal of any other electrode in the particular second electrode array by a center-to-center distance greater than the center-to-center spacing between the latter one electrode and the latter other electrode, while arranging said second individual terminals side by side along the other of said parallel edges to provide each second individual terminal with an individual connecting lead path being free of any other terminal and intersecting a plane through the other of said parallel edges for connection of a lead to the particular second individual terminal;

providing all individual first terminals and all individual second terminals for all of said complete first and second electrode arrays of each chip on that same chip;

arranging the chips side by side into an elongate light gate structure, with any two adjacent chips having said first side of one of these two chips placed in abutment with a said second side of the other of these two chips;

providing a first one of said electrodes in each chip along and coincident with said first side of the particular chip, and a second one of said electrodes in the particular chip along and coincident with said second side of the particular chip; and

arranging said chips side by side into an elongate light gate structure, with any two adjacent chips having a said first electrode of one of these two chips placed in abutment with a said second electrode of the other of these two chips.

4,533,218

ZOOM LENS OPERATING MECHANISMS

Kunio Nakazato, Machida, and Kazuya Ozawa, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 28, 1983, Ser. No. 518,135
Claims priority, application Japan, Jul. 30, 1982, 57-133209
Int. Cl.³ G02B 7/04
U.S. Cl. 350—430 **8 Claims**

1. A zoom lens operating mechanism comprising:

a stationary cylinder;

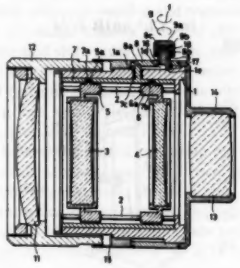
an operating ring mounted for rotation in respect to said stationary cylinder;

a cam cylinder mounted for rotation in respect to said stationary cylinder and coupled to said operating ring for rotation with said operating ring;

at least one lens group coupled to said cam cylinder for motion within a zoom range as said operating ring is rotated within a first angular range and for motion within a close-up range as said operating ring is rotated within a second angular range;

extended guide means formed in said stationary cylinder and having first and second contiguous lengths corresponding to said first and second angular ranges, respectively, and a stop portion between said contiguous lengths;

an operating manular member mounted on said operating ring for motion with the latter along said guide means and for rotation relative to said operating ring between first and second positions; and



locking means movable along said guide means with said operating member and coupled to the latter to move between a locking position engageable with said stop portion and a released position free of said stop portion in response to rotation of said operating member to said first and second positions, respectively,

whereby said operating member may be moved from said first length to said second length only when said operating member is rotated into said second position.

4,533,219

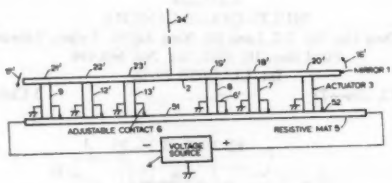
TIP-TILT MIRROR ACTUATION SYSTEM EMPLOYING A SINGLE CONTROL VOLTAGE

Ralph E. Aldrich, Acton, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 14, 1984, Ser. No. 589,378

Int. Cl.³ G02B 7/18

U.S. Cl. 350—487 **14 Claims**



1. In a tip-tilt control system for selectively controlling the orientation of an optical element having a central portion:

a plurality of electromechanical actuators, each having an input circuit, said actuators being coupled to said optical element for displacing a portion thereof by amounts proportional to voltages applied to the input circuits of said actuators;

a two-dimensional impedance network;

a control voltage source for producing voltage gradients across said network; and

means for adjustably coupling the input circuit of each actuator to various points upon said impedance network until particular points are found for producing displacement of the optical element for a given voltage gradient applied across said network without inducing bending stresses in said optical element.

4,533,220

INDICATING DEVICE FOR INDICATING DATA WITHIN THE VISUAL FIELD OF MICROSCOPE

Hiroyuki Kurita; Yuko Kobayashi, both of Hachiouji; Shinichi Dosaka, Fujino; Juro Kikuchi, Hachiouji; Hiroshi Takase, Hachiouji, and Kenichi Harada, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

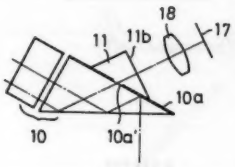
PCT No. PCT/JP82/00412, § 371 Date Apr. 11, 1983, § 102(e) Date Apr. 11, 1983

PCT Filed Oct. 15, 1982, Ser. No. 491,326

Claims priority, application Japan, Oct. 15, 1981, 56-164432

Int. Cl.³ G02B 27/34, 21/00

U.S. Cl. 350—507 **1 Claim**



1. An indicating device for indicating data in a visual field of a microscope comprising: an objective lens, and eyepiece, a light reflecting means arranged obliquely to an optical axis of said objective lens and having a transparent portion at a site located outside of said optical axis; data display means arranged above said light reflecting means; a light leading optical system for leading thereinto an information light from said display means through said transparent portion; and a reflecting surface reflecting a light reflected by said reflecting means and a light led in through said transparent portion to direct them to said eyepiece.

4,533,221

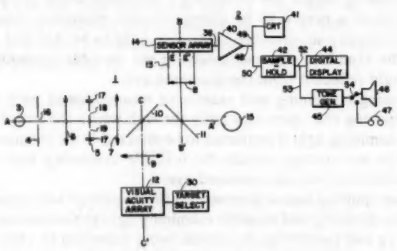
METHODS AND APPARATUS FOR ACCOMMODATION TRAINING

Joseph N. Trachtman, 57 Hicks St., Brooklyn, N.Y. 11201

Filed Jan. 25, 1983, Ser. No. 460,850

Int. Cl.³ A61B 3/00

U.S. Cl. 351—203 **64 Claims**



1. Accommodation training apparatus comprising:

optometer means for imaging radiation onto the plane of the pupil of an eye to form a retinal image and directly measuring the refraction of said eye as a function of said retinal image, said optometer means providing outputs representing said refraction of said eye on a periodic basis and at a rate corresponding to a plurality of measurements each second;

audio means responsive to each output of said optometer means for producing biofeedback tone information having a frequency representative of the refraction of an eye

being measured to provide an indication of the current state of accommodation during training; and

side channel means for selectively placing blur cue information into said optometer means for projection by said optometer means onto the retina of said eye during training to permit accommodation training to selectively occur in the presence of a focusing target.

4,533,222

EYE EXAMINING INSTRUMENT

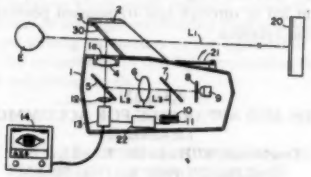
Yasuyuki Ishikawa, Kawaguchi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 521,015, Aug. 8, 1983, abandoned, which is a continuation of Ser. No. 197,593, Oct. 16, 1980, abandoned. This application Jul. 20, 1984, Ser. No. 632,680

Claims priority, application Japan, Oct. 25, 1979, 54-137944

Int. Cl.³ A61B *3/14, 3/10*

U.S. Cl. 351—206 **13 Claims**



1. An eye examining instrument comprising:

examining means, for measuring a refraction error of each eye of a person to be examined, said examining means projecting an invisible examining light to be directed to the examined eye and receiving the invisible examining light reflected from the examined eye;

a casing containing said examining means formed with an opening that opens upwardly through which the invisible examining light is projected to be directed to the examined eye and through which the invisible examining light is received from the examined eye;

beam splitting means disposed on the outside of said casing for directing said invisible examining light to the examined eye and permitting the person being examined to view a fixation object spaced from said casing, said beam splitting means including a mirror that transmits visible light and reflects the invisible examining light, said mirror having a sufficient width to allow both eyes of the person to be examined to view simultaneously the fixation object while either of the person's eyes can be examined by moving said instrument laterally with respect to the eyes; and

shielding means for covering said beam splitting means so as to shield it from undesirable light but for allowing the eye to view the fixation object through said beam splitting means, said shielding means having a top surface and two side surfaces, said side surfaces transmitting visible light, and said top surface being opaque.

4,533,223

PROCESS OF FORMATION OF AN IMAGE OF THE EYE FREE FROM REFLECTIONS FOR ITS RECORDING BY PICTURE TAKING AND/OR ITS OBSERVATION AND APPARATUS FOR PUTTING INTO ACTION OF THE PROCESS

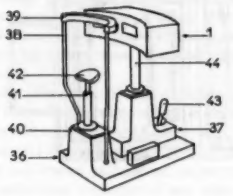
Jacques Duparchy, 10 Rue Alquier Bouffard, 8100 Castres, France

Filed Apr. 30, 1982, Ser. No. 373,631

Claims priority, application European Pat. Off., May 5, 1981, 81 400701.9

Int. Cl.³ A61B *3/14*

U.S. Cl. 351—206 **21 Claims**



1. A method of forming an image of an eye, comprising the steps of:

(a) partially coating the eye with a fluorescent substance;

(b) exposing the eye coated with fluorescent substance to radiation from a radiation source so as to excite the fluorescent substance to emit radiation, said radiation from said radiation source being reflected on the eye, the wavelengths of the radiation from the radiation source and reflected off the eye being less than or equal to the smallest wavelength of the radiation emitted by the fluorescent substance; and

(c) filtering radiation emitted by the fluorescent substance and radiation from the radiation source and reflected off the eye to select radiation emitted by the fluorescent substance, so as to increase the contrast between the portion of the eye coated with the fluorescent substance and the portion of the eye not coated with the fluorescent substance.

4,533,224

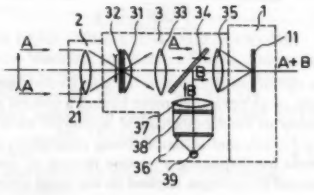
MULTI-IMAGE CAMERA

Jan-Chou Ou, No. 7-2, Lane 60, Ning An St., Taipei, Taiwan

Filed Dec. 10, 1982, Ser. No. 448,494

Int. Cl.³ G03B *29/00*

U.S. Cl. 354—77 **3 Claims**



1. A multi-image camera comprising a camera body, a camera lens set, and an attachable image transfer cartridge being attached between said camera body and said camera lens set, said image transfer cartridge comprising a field lens, a mask, an image transfer lens, a partial reflecting mirror, a slide transparency, an image converging lens, and a slide projecting lens, whereby an external picture image passes through said camera lens set, mask, field lens and projects onto said partial reflecting mirror, and upon said partial reflecting mirror said slide

transparency also has its subject image projected thereon, both said external picture image and said slide transparency image merge and form a combined image after leaving said partial reflecting mirror and projecting onto said image converging lens which focuses and projects said combined image on a negative film contained in said camera body, wherein said image transfer cartridge includes said mask positioned on the focal plane of said camera lens set, said field lens positioned behind said mask, said image transfer lens to convert the image light rays from the field lens into a parallel light beam, said partial reflecting mirror to receive and transmit the light beam coming from the image transfer lens and also to receive said light beam from said slide projecting lens, said slide projecting lens for projecting the slide image light beam on the backside of said partial reflecting mirror, said slide installed in front of said projecting lens, and a filter installed in front of said projecting lens, a lamp to illuminate the slide, and said convergent lens installed behind the partial reflecting mirror for superimposing the outside scenery image light rays entering through said camera lens set, the mask, the field lens, the transferring lens, the partial reflecting mirror and the subject image light rays of said slide coming through said slide projecting lens, the back of the partial reflecting mirror so as to form a combined image on the film, which is on the focal plane of said convergent lens.

4,533,225

SENSITIVE MATERIAL PROCESSING APPARATUS

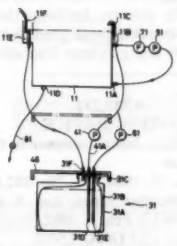
Koji Shiga, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 25, 1984, Ser. No. 573,756

Claims priority, application Japan, Jan. 25, 1983, 58-8752[U]; Jan. 25, 1983, 58-8756[U]; Jan. 25, 1983, 58-10238

Int. Cl.³ G03B *3/06*

U.S. Cl. 354—322 **6 Claims**



1. An apparatus for a processing sensitive material by conveying said sensitive material through a plurality of serially arranged processing sections including a developing section, a development-stopping section, a fixing section and a washing section, comprising; a plurality of removable cartridges for containing processing liquids and washing-water for use in respective ones of said sections; means for conveying said processing liquids and said washing-water from said cartridges to said respective ones of said sections; means for replacing any one of said cartridges; and movable platform means for separating said conveying means from respective ones said cartridges.

4,533,226

STILL OR MOTION PICTURE CAMERA

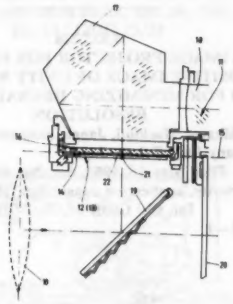
Giovanni Odone, CH-Saint-Sulpice, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 3, 1983, Ser. No. 471,635

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211659; Jul. 13, 1982, 3226118; Aug. 30, 1982, 3232192

Int. Cl.³ G03B *7/099*

U.S. Cl. 354—403 **20 Claims**



1. A reflex camera having an objective adapted for focussing incoming light rays on a film plane, a viewfinder provided with means for deflecting the light rays from the objective on a viewfinder plane and an active rangefinder provided with an infrared transmitter for directing a beam of infrared light on a selected object, an infrared receiver comprising an infrared image plate extending along said viewfinder plane in the path of light rays reflected from said deflecting means, an infrared sensor arranged at a rim portion of said infrared image plate and an infrared light reflecting surface embedded in a portion of said infrared image plate and being inclined thereto at an angle for directing incoming infrared light rays towards said sensor.

4,533,227

DISTANCE MEASURING CIRCUIT

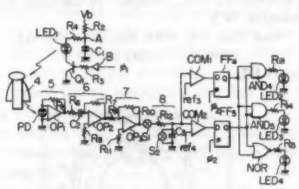
Akira Takahashi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 299,291, Sep. 3, 1981, Pat. No. 4,479,706. This application Apr. 13, 1984, Ser. No. 599,772

Claims priority, application Japan, Sep. 9, 1980, 55-125168; Sep. 9, 1980, 55-125169; Sep. 9, 1980, 55-125170; Sep. 30, 1980, 55-136366; Sep. 30, 1980, 55-136367

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—403 **1 Claim**



1. A distance measuring circuit comprising:

a light projecting means for projecting a light beam toward a target;

a light receiver means for receiving reflected light from said target and outputting a signal; and

means for determining the level of said signal from said light receiver means including a plurality of amplifiers with each of said amplifiers having a different gain and each of

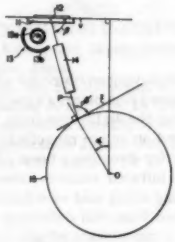
said amplifiers outputting an amplified signal and wherein said determining means further includes a plurality of comparison means for comparing the respective said amplified output signals from said plurality of amplifiers with respective associated reference voltages, wherein the gain of each of said amplifiers is determined in accordance with each of said respective reference voltages whereby the operation of said light projecting means, said light receiver means and said determining means is controlled in a predetermined sequence by control means.

4,533,228

OPTICAL IMAGE PROJECTOR FOR PROJECTING AN ERECT POSITIVE IMAGE OF UNITY MAGNIFICATION AND FOR MINIMIZING DEGRADATION IN RESOLUTION

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed May 16, 1983, Ser. No. 494,643
Claims priority, application Japan, Jun. 15, 1982, 57-102404
Int. Cl.³ G03B *27/70, 27/00*
U.S. Cl. 355—1 **8 Claims**



1. An optical image projector including an array of optical focusing elements which projects an erect positive image of unity magnification of an object onto an image receiving surface which is not parallel to a first plane in which the object is obtained;

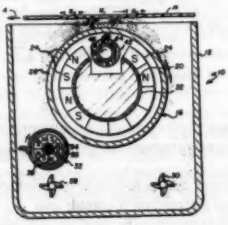
characterized in that the array, the first plane of the object and an image receiving surface are disposed in a manner such that an angle formed between the optical axis of the array and the plane of the object is substantially equal to an angle formed between the optical axis and the image receiving surface, and is located on the same side of the optical axis as the latter angle.

4,533,229

MAGNETIC BRUSH DEVELOPER APPARATUS

Wei C. Lu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 14, 1983, Ser. No. 474,901
Int. Cl.³ G03G *15/08*
U.S. Cl. 355—3 DD **4 Claims**



1. In magnetic brush developer apparatus for developing an electrostatic charge pattern on a member by contacting the member with particulate magnetic developer material, said apparatus including applicator means for transporting such developer material in a non-agitated state into contact with such charge pattern, the improvement comprising:

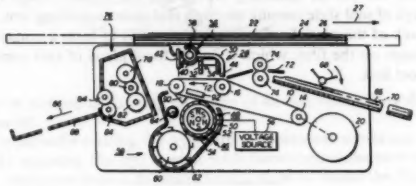
magnetic means, operatively associated with said applicator means, for agitating a portion of developer material in contact with such charge pattern to form in such material an agitated zone bounded by the non-agitated material to establish a sealing zone about the agitated zone.

4,533,230

PIN CHARGING DEVICE FOR USE IN XEROGRAPHY

Gerald M. Fletcher, Pittsford; Robert M. Jacobs, Rochester, and Kenneth W. Pietrowski, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1983, Ser. No. 461,074
Int. Cl.³ G03G *15/02*
U.S. Cl. 355—3 CH **3 Claims**



1. Charging apparatus for applying a uniform negative electrostatic charge to a charge retentive surface, said apparatus comprising:

an array of pin electrodes supported adjacent said surface in a non-contact relationship;

the end of each pin nearest said surface having radius small enough to provide uniform discharge with a predetermined current supplied thereto, said radius being less than 0.025 millimeter;

means for effecting relative movement between said pin electrodes and said charge retentive surface; and

a power supply operatively coupled to said pin electrodes for supplying said predetermined current to each pin electrode, the magnitude of said current being sufficient to insure substantially uniform discharge therefrom over the life of said pin electrodes, said predetermined current to each pin electrode being at least four microamperes.

4,533,231

FIXING DEVICE

Michio Shigenobu, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 19, 1984, Ser. No. 652,415
Claims priority, application Japan, Aug. 4, 1981, 56-122613; Dec. 4, 1981, 56-181274[U]; Feb. 5, 1982, 57-17206
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU **31 Claims**

1. A fixing device, comprising:

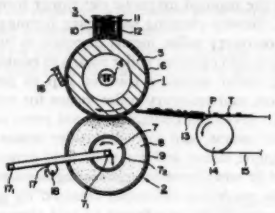
first and second rotating members arranged to form a nip therebetween to grip and transport therebetween an image bearing member having an unfixed image on one surface thereof and thereby to fix the image on the image bearing member;

means for urging one of said rotating members toward the other;

means for heating at least the first rotating member, said heating means being provided inside of said at least the first rotating member; and

said second rotating member having on its surface a first layer formed of heat-resistant resin and a second layer provided

inside of said first layer and formed silicone rubber sponge having a number of gas cells, said second rotating member



contacting the surface of said image bearing member opposite the surface bearing said unfixed image to urge said unfixed image to the first rotating member.

4,533,232

ELECTROPHOTOGRAPHIC PROCESS

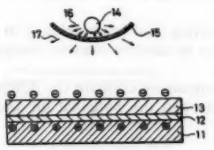
Naoto Fujimura, Yokohama; Akihiro Sonobe, Tokyo; Toshiyuki Yoshihara, Mitaka; Norie Takebayashi, Tokyo; Takashi Tanaka, Kawasaki, and Masaki Kuribayashi, Higashi Kurume, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 474,178

Claims priority, application Japan, Mar. 18, 1982, 57-43836

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 R **47 Claims**



1. An electrophotographic copying machine comprising:

(1) an electrophotographic photosensitive member having a conductive substrate and a photosensitive layer including a charge generation layer and a charge transport layer;

(2) means for charging said electrophotographic photosensitive member;

(3) means for forming a latent image on said electrophotographic photosensitive member by exposing said electrophotographic photosensitive member to light, said latent image forming means including a light source and at least one of an ultraviolet-absorbing filter and a yellow filter disposed in the optical path between said electrophotographic photosensitive member and said light source; and

(4) means for developing the latent image formed on said electrophotographic photosensitive member with a developer.

4,533,233

ELECTROSTATIC COPYING APPARATUS

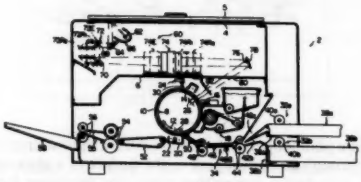
Hiroshi Kimura, Habikino; Masahiko Hisajima; Kiyoshi Shibata, both of Osaka; Yoichiro Irie, Suita; Kiyoshi Morimoto, Osaka; Takashi Nagashima, Sakai; Yasuhiko Yoshikawa, Ikoma; Kiyonori Yamamoto, Neyagawa; Masahiro Watashi, Ikoma; Shinsuke Yoshinaga, Sakai, and Toshihiko Yamamoto, Takaishi, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Apr. 14, 1983, Ser. No. 485,082

Claims priority, application Japan, Apr. 20, 1982, 57-64664

Int. Cl.³ G03G *15/28*

U.S. Cl. 355—8 **31 Claims**



1. A variable magnification electrostatic copying apparatus comprising

a stationary transparent plate on which to place a document to be copied,

an optical system for projecting the image of the document onto an electrostatographic photosensitive member at a desired projecting ratio selected from a plurality of projecting ratios in an exposure zone located along the moving path of the photosensitive member, said optical system including a first reflecting mirror assembly adapted for reciprocation along the transparent plate, a second reflecting mirror assembly adapted to be reciprocated in synchronism with the reciprocation of the first reflecting mirror assembly substantially parallel to the reciprocating direction of the first reflecting mirror assembly and at a speed one-half of the moving speed of the first reflecting mirror assembly, and a lens assembly adapted to be held at any one of a plurality of positions corresponding to the plurality of projecting ratios, the changing of the projecting ratio being effected by changing the position of the lens assembly and also changing the position of the second reflecting mirror assembly relative to the first reflecting mirror assembly in the reciprocating direction of the second reflecting mirror assembly,

a driving means for reciprocating the first and second reflecting mirror assemblies, and

means for varying the projecting ratio of the optical system by moving the lens assembly and the second reflecting mirror assembly;

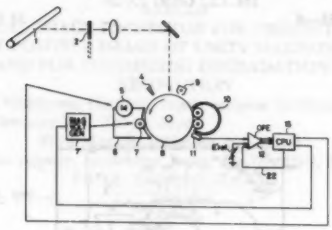
wherein said projecting ratio varying means includes a driving source, a setting member adapted to be held at any one of a plurality of positions corresponding to the projecting ratios for moving the second reflecting mirror assembly, a first drivingly linking means interposed between the driving source and the lens assembly, and a second drivingly linking means interposed between the driving source and the setting member, and when the driving source is operated, the lens assembly is moved and at the same time, the setting member is moved to move the second reflecting mirror assembly.

4,533,234

AUTOMATIC DENSITY CONTROL METHOD FOR A PHOTOCOPYING MACHINE

Yuji Watai; Hirokazu Yasui; Yoshiyuki Hirayama, and Akira Matsuura, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,739
Claims priority, application Japan, Aug. 3, 1981, 56-122319
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 D **8 Claims**



2. In a photocopying device in which a light source transmit light through an optical path to the surface of a photosensitive drum, said device comprising means for supplying toner at a certain density to the surface of said drum, means for developing an image upon said surface of said drum, and means for cleaning said drum, a density controlling system comprising:

means for generating a signal indicative of an optimal value of said density of said toner;

means for sensing the amount of toner supplied to said surface of said drum by said toner supplying means and producing an output signal indicative of said sensed density;

means for comparing said output signal indicative of said sensed density with said signal indicative of said optimal density and producing a control signal;

means for sampling and stabilizing said control signal; and

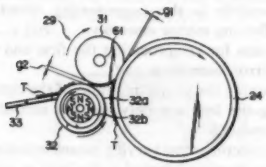
means for controlling both of said developing means and said toner supply means as a function of said stabilized control signal.

4,533,235

CLEANING DEVICE FOR USE IN AN IMAGE FORMING APPARATUS

Kohachi Uchida, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Dec. 23, 1982, Ser. No. 452,867
Claims priority, application Japan, Feb. 3, 1982, 57-14850
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **9 Claims**



1. A cleaning device for cleaning an image forming body by removing residual magnetic developer left on a surface of said image forming body which supports a visible image formed by the magnetic developer, after a transfer operation is finished, said cleaning device comprising:

rotatable cleaning roller means having a portion in contact with said image forming body, said cleaning roller means including a porous elastic member having a number of pores therein for retaining the residual magnetic developer left on the surface of said image forming body to remove the residual magnetic developer from the surface thereof, thereby cleaning said image forming body; and

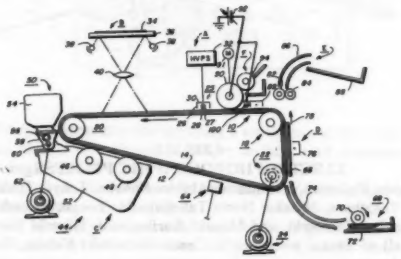
rotatable recovery roller means disposed in opposing relationship to said cleaning roller means to establish with said cleaning roller means a transfer gap to predetermined dimension, said recovery roller means for recovering the magnetic developer contained in said pores of said cleaning roller means, said recovery roller means including a nonmagnetic sleeve and magnetic field generating means disposed in said sleeve for generating a magnetic field to cause the magnetic developer retained by said cleaning roller means to be transferred to said sleeve across said transfer gap to thereby recover the magnetic developer from said cleaning roller.

4,533,236

CHARGE PARTICLE REMOVAL DEVICE

Paul A. Garsin, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1983, Ser. No. 556,801
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **10 Claims**



1. Apparatus for removing charged particles from a charge-retentive surface, said apparatus comprising:

a magnetic brush cleaner structure, including magnetically attractable elements;

means for applying a bias voltage to said brush cleaner structure;

means for moving said brush relative to said charge-retentive surface to thereby remove charged particles therefrom; and

means for maintaining constant the difference between said bias voltage and the potential on said charge-retentive surface.

4,533,237

METHOD AND DEVICE FOR REGISTERING THE USE OF COPYING MACHINES

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen; Hans-George Winderlich, Niedere Str. 36, D-7730 Villingen; Siegfried Bauer, Kussenhofstr. 16, D-7743 Furtwangen, and Zeljko H. Adamovic, Hochstr. 6, D-7730 Villingen/Schwenningen, all of Fed. Rep. of Germany

Continuation of Ser. No. 553,421, Nov. 18, 1983, abandoned, which is a continuation of Ser. No. 302,096, Sep. 14, 1981, abandoned. This application Jul. 9, 1984, Ser. No. 628,802
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042132; Mar. 23, 1981, 3111354; May 18, 1981, 3119756; Jun. 24, 1981, 3124836
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—40 **7 Claims**

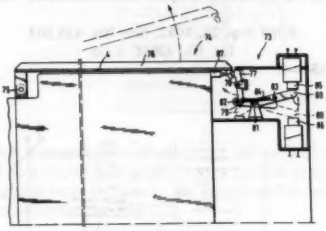
1. A copier system comprising:

(a) means for detecting user identity information,

(b) means for converting said detected user identity information into a form for recording such information on a record of a document,

(c) means for receiving a document to be copied, said means including a support and a cover,

(d) means for locking said cover to hold the document to be copied until such time as the cover is unlocked,



(e) means for recording said document with said user identity information on said record,

(f) means for storing said record of said document containing said user identity information in said copier system, and

(g) means for unlocking said means for locking to release the cover after determining that a record of said document containing said user identity information has been stored in said copier system.

4,533,238

EXPOSURE DETECTING DEVICE FOR COPYING MACHINE

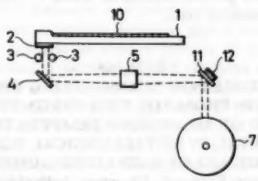
Seikichi Miyazaki, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,493

Claims priority, application Japan, Jul. 23, 1982, 57-128511

Int. Cl.³ G03B *27/74*

U.S. Cl. 355—68 **8 Claims**



1. A copying machine comprising: a light source for illuminating an original; an optical system for providing an image of the illuminated original on a photosensitive body, said optical system comprises:

a multilayer film interference filter which transmits light rays in one spectral range in which said photosensitive body is not sensitive and reflects light rays in all other ranges to said photosensitive body without attenuation;

a photosensor arranged on a rear surface of said multilayer film interference filter responsive to light rays in said one spectral range; and

control circuit means for varying an intensity of said light source in accordance with an output of said photosensor.

4,533,239

POSITIONING DEVICE FOR AN EXPOSING AND DEVELOPING APPARATUS

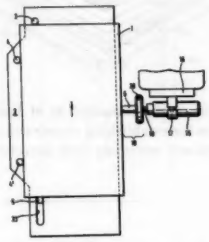
Günter Back, Diedenbergen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,466

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220861

Int. Cl.³ G03B *27/58*

U.S. Cl. 355—72 **19 Claims**



1. A positioning device for an exposing and developing apparatus for printing forms comprising:

an exposure table having an exposure position with a forward side, a rear side, and two lateral sides; and

said positioning device being capable of positioning individual printing forms on said exposure table, and comprising:

a mechanism for positioning individual printing forms in a transverse direction comprising: stop pins mounted on said exposure table on one side of said exposure position; a pressure member mounted opposite said stop members; and means for moving said pressure member laterally of said exposure position toward said stop pins for forcing a printing form laterally against said stop pins; and

a mechanism for longitudinally positioning individual printing forms comprising: a stop mounted on said exposure table on said exposure position front side; and a slide mounted for movement forward toward said exposure position for forcing a printing form toward said forward side stop;

wherein said transverse positioning mechanism and said longitudinal positioning mechanism are adapted to be actuated simultaneously.

4,533,240

FILM TO PANEL REGISTRATION DEVICE

Carl R. Jasperson, Anaheim, Calif., assignor to Lowell A. Rodgers and Vernon C. Rodgers, both of Anaheim, Calif.

Filed Jul. 30, 1982, Ser. No. 404,517

Int. Cl.³ G03B *27/28*

U.S. Cl. 355—125 **9 Claims**

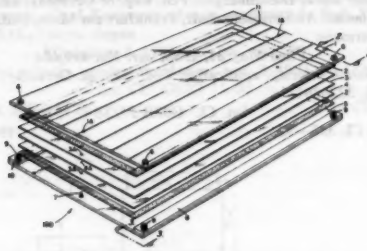
1. A registration device comprising,

a pair of planar members having relatively large surface area,

said planar members fabricated of a material which is selected to be substantially transparent to a specified radiation,

connector means mounted at two or more corners of said

pair of planar members to permit said planar members be selectively connected and disconnected, and



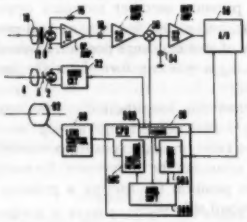
registration means mounted at at least one of said planar members for establishing registration of said pair of planar members and materials held therebetween.

4,533,241

DISTANCE MEASURING DEVICE AND AUTOMATIC FOCUSING SYSTEM USING SAME

Makoto Masunaga, and Hideo Taka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,880
Claims priority, application Japan, Jul. 22, 1981, 56-114851
Int. Cl.³ G01C *3/10*; G03B *7/08*
U.S. Cl. 356—1 **6 Claims**



1. A device comprising:

scanning means for scanning the area of an object by projecting a beam of modulated radiation and directionally sensing the reflections of the projected beam along a path while moving the beam and the path relative to each other;

converting means for converting the radiation sensed by said scanning means into digital data in synchronism with the modulation of the radiation being projected by said scanning means; and

means for processing the digital data formed by said converting means for every predetermined plurality of cycles of the digital conversion of said converting means;

said processing means including:

means for detecting the difference between the digital data formed by said converting means in each of the cycles, said difference detecting means producing difference data indicative of said difference; and

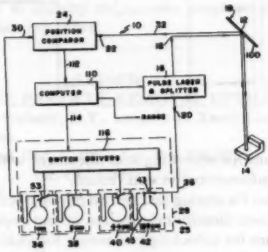
means for averaging the difference data produced by said difference detecting means every predetermined plurality of cycles of the converting means, said averaging means being arranged for producing averaged difference data which varies in accordance with the change in the energy intensity of the projected radiation on said sensing means.

4,533,242

RANGING SYSTEM WHICH COMPARES AN OBJECT-REFLECTED COMPONENT OF A LIGHT BEAM TO A REFERENCE COMPONENT OF THE LIGHT BEAM

John M. McLauchlan, Pasadena; John AuYeung, Alhambra; Eldred F. Tubbs, Claremont; Willis C. Goss, and Demetri Psaltis, both of Altadena, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 28, 1982, Ser. No. 425,202
Int. Cl.³ G01C *3/08*
U.S. Cl. 356—5 **5 Claims**



1. A distance measuring system comprising:

means for generating a pair of components of a pulse of light, including an object component and a reference component;

a detector assembly including a detector with opposite ends and a side, said detector formed of a material that produces a harmonic light output that can be detected at a side of the detector when components of a light pulse that are directed into the opposite ends of the detector pass simultaneously in opposite directions through at least a portion of the detector, said assembly also including means for indicating the position of harmonic light output from the detector;

means for directing the object component toward an object and directing light reflected from the object into a first end of the detector; and

means for directing the reference component along a reference path of known length and into the second end of the detector to determine the length of the object component path by the precise position at which it crosses the reference component path.

4,533,243

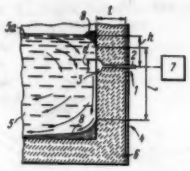
LIGHT GUIDE FOR TRANSMITTING THERMAL RADIATION FROM MELT TO PYROMETER AND METHOD OF MEASURING TEMPERATURE OF MOLTEN METAL IN METALLURGICAL VESSEL WITH THE AID OF SAID LIGHT GUIDE

Leonid F. Zhukov; Evgeny G. Chugunny, both of Kiev; Garold P. Samchenko, Lvov; Vladimir S. Shumikhin, Kiev; Mechislav V. Zhelnis, Kaunas; Ivan V. Kushinsky, Lvov, and Pranas V. Zemlyavichus, Kaunas, all of U.S.S.R., assignors to Institut Problem Litiya Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

PCT No. PCT/SU80/00120, § 371 Date Mar. 15, 1982, § 102(e) Date Mar. 15, 1982, PCT Pub. No. WO82/00518, PCT Pub. Date Feb. 18, 1982
PCT Filed Jul. 31, 1980, Ser. No. 361,904
Int. Cl.³ G01J *5/08*
U.S. Cl. 356—44 **7 Claims**

1. A light guide for transmitting thermal radiation from a melt to a pyrometer, being substantially a rod made from a refractory light-permeable corrosion-resistant material having a narrow portion intended for transmitting radiation to the

pyrometer and a large portion with a flat end forming the operating end of the light guide, the lateral surface of said large portion providing reflection of radiation of the operating end of said large portion from the convex lateral surface of this



portion back to said flat operating end; the ratio of the cross-sectional area of said light guide narrow portion at the place of adjoining said large portion to the lateral surface area of this large portion not exceeding 0.5.

4,533,244

PROCESS FOR AUTHENTICITY DETERMINATION OF SECURITY DOCUMENTS WITH SECURITY FEATURES IN THE FORM OF LUMINESCING SUBSTANCES

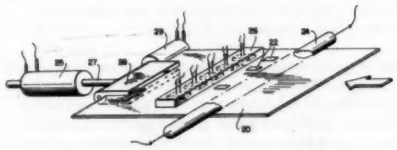
Wittich Kaule, Gauting; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 314,840, Oct. 23, 1981, Pat. No. 4,442,170. This application Mar. 7, 1984, Ser. No. 586,962

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020601

Int. Cl.³ G07D *7/00*; G01N *21/64*

U.S. Cl. 356—71 **12 Claims**



1. A process for authenticity determination of a security document, comprising:

providing said document with a luminescing substance having a known excitation spectrum and a known emission spectrum wherein at least a portion of said excitation spectrum and a portion of said emission spectrum are contained in a narrow band of wavelengths and at least a portion of said excitation spectrum overlaps at least a portion of said emission spectrum in said narrow wavelength band;

exciting said document within said narrow band; and

sensing the emissions of said security documents in said narrow band caused by said excitation in said narrow band.

4,533,245

INSPECTION LIGHTING SYSTEM

Franklin S. Love, III, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 30, 1982, Ser. No. 429,957

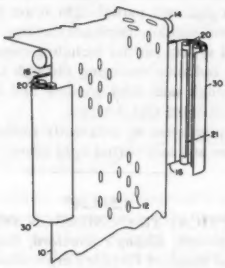
Int. Cl.³ G01N *21/47, 21/88*

U.S. Cl. 356—238 **7 Claims**

1. A method for illuminating an area of a textile substrate carrying sculptured areas comprising changes in the surface contour of the substrate of less than about 0.003 inches, for the purpose of facilitating visual inspection of the sculptured areas in said area while so illuminated, said method comprising the steps of:

(a) positioning said substrate carrying said sculptured surface in front of a visually dark, non-reflective visual background;

(b) placing said substrate under tension to remove wrinkles and other unintended surface irregularities; and



(c) substantially exclusively illuminating an area of said sculptured surface of said substrate with an opposed pair of light sources, each light source directing substantially all its illumination in the general direction of the opposing light source, each light source positioned so that light striking the central portion of said area of illumination does so at an angle, as measured from the plane of said substrate, of between about 3° and about 12°.

4,533,246

PHOTOMETER FOR MEASURING ATOMIC FLUORESCENCE

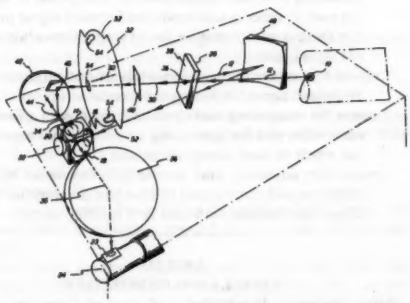
Klaus Braun, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 482,086

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215249

Int. Cl.³ G01N *21/64*

U.S. Cl. 356—317 **7 Claims**



1. Photometer for measuring atomic fluorescence, comprising:

a light source;

an optical system for generating an exciting light beam emanating from said light source; said optical system including a beam splitter, by means of which a partial light beam can be branched off said exciting light beam;

a measuring cell, said measuring cell including a first window through which said exciting light beam enters said measuring cell, a second window through which fluores-

cence radiation transverse to the direction of said exciting light beam can be detected and a third window disposed opposite said second window;

said optical system including means to direct said exciting light beam through said first window and means to direct said partial light beam through said third window in a direction transverse to the direction said exciting light beam enters said cell through said first window;

a photoelectric detector arranged such that the fluorescence radiation and said partial light beam emerging through said second window impinges thereon;

said optical system further including means to reflect fluorescence radiation emerging through said third window back through said third window and into said cell in a direction toward said detector;

a chopper positioned to differently modulate said exciting light beam and said partial light beam.

4,533,247

OPTICAL TRANSMISSION SYSTEM

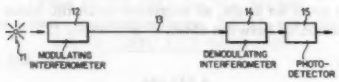
Richard E. Epworth, Bishop's Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,741

Claims priority, application United Kingdom, Sep. 3, 1981, 8126695

Int. Cl.³ G01B *9/02*

U.S. Cl. 356—345 **12 Claims**



1. An optical transmission system, comprising

a light source,

means for modulating the light emanating from said light source, including a first interferometer having variable optical properties and operative for issuing optical signals into an optical path for propagation therein, and means for imposing modulation onto said first interferometer to vary said optical properties thereof and thus to convert said optical output signals into modulated optical signals;

means for demodulating said modulated optical signals, including a second interferometer interposed in said optical path to receive said modulated optical signal propagating therein and operative for issuing a demodulated optical signal; and

means for converting said demodulated optical signal into an electrical signal, including a photodetector;

means for comparing said electrical signal with a fixed reference value and for generating an error signal representing the result of such comparison; and

means for adjusting said second interferometer in dependence on said error signal to maintain the same in constant phase relationship with said first interferometer.

4,533,248

RING LASER GYROSCOPE

Rainer Baumann, Bruchköbel, Fed. Rep. of Germany, assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Sep. 23, 1982, Ser. No. 422,104

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150160

Int. Cl.³ G01C *19/64*

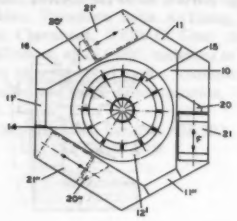
U.S. Cl. 356—350 **11 Claims**

1. A ring laser gyroscope comprising:

a first block for providing a path for light waves;

a mounting block;

torsion spring means for rotating said first block spring means having a first portion fixed to said first block and a second portion fixed to said mounting block; and



linear motor means positively locked and tangentially coupled to said first block for oscillating said first block relative to said mounting block in response to a driving signal.

4,533,249

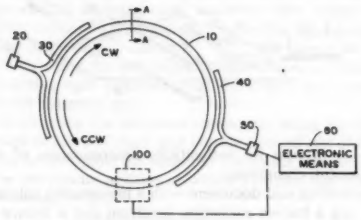
PASSIVE RING RESONATOR ANGULAR RATE SENSOR

George E. Webber, Buffalo, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,502

Int. Cl.³ G01B *9/02*; G01C *19/64*

U.S. Cl. 356—350 **11 Claims**



1. A passive ring resonator angular rate sensor comprising:

a passive ring resonator waveguide structure for providing a closed-loop path capable of propagating first and second counter-propagating waves of energy about said closed-loop path, wherein the rate of rotation of said closed-loop path establishes an effective closed-loop path length defining at least one resonant frequency of said first wave and at least one resonant frequency of said second wave;

source means capable of producing broad band electromagnetic energy wave;

coupling means for concurrently introducing at least a portion of said broad band electromagnetic energy in opposite directions about said closed-loop path thereby providing coexisting first and second counter-propagating waves, each at its respective resonant frequency; and

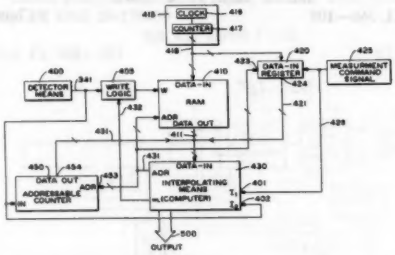
combining means responsive to at least a portion of said first and second waves for combining said waves so as to produce an output signal having a difference signal component related to the difference between said resonant frequency of said first and second waves indicative of the rotation rate of said closed-loop path.

4,533,250

READOUT APPARATUS FOR A RING LASER ANGULAR RATE SENSOR

Timothy J. Callaghan, Minneapolis, Minn., and Robert M. Kay, Seminole, Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 11, 1983, Ser. No. 484,108
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **16 Claims**



1. An apparatus for counting fringe changes of a varying interference fringe pattern comprising:

detector means responsive to said varying interference fringe pattern capable of providing a selected signal for each occurrence of a selected fringe change of said varying interference fringe pattern;

timing means responsive to said selected signal having,

first means for determining an interpolation time where said interpolation time is the elapsed time between an occurrence of a measurement command signal and an immediately preceding occurrence of said selected signal, and

second means capable of determining at least a first intersignal time, said intersignal time being the elasped time between two selected occurrences of said selected signal; and

interpolation means responsive to said interpolation time and said at least a first intersignal time for providing an output signal representative of an interpolated fringe change, said interpolated fringe change being the fringe change of said varying interference fringe pattern occurring during said interpolation time.

4,533,251

APPARATUS AND PROCESS FOR AUTOMATICALLY MEASURING APERTURE SIZE OF APERTURED MATERIAL

Kenneth French, Merrimack, N.H.; Robert C. Kocher, Harvard, Mass.; Alfred Piorkow, Lancaster, S.C.; Kenneth Shaner, Towanda, Pa., and J. Thomas Smith, Acton, Mass., assignors to GTE Products Corporation, Stamford, Conn.

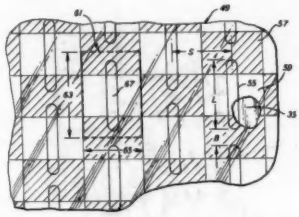
Filed Jun. 9, 1980, Ser. No. 158,023
Int. Cl.³ G01B *11/02*
U.S. Cl. 356—384 **17 Claims**

1. Apparatus for automatically measuring aperture size of a slotted apertured material including means for supporting and transporting the slotted apertured material and a light source and a light detector aligned therewith and disposed on opposite sides of the slotted apertured material said light source providing a light beam directed for passage through the slotted apertured material and impingement of the light detector, said apparatus characterized by the improvement comprising:

comparator mask means having a plurality of sections of alternate light opaque and transparent sectors, said sectors of each of said sections being of a given dimension;

means for supporting and transporting said comparator mask means; and

means coupled to said means for supporting and transporting the slotted apertured material, said means for supporting and transporting said comparator mask means, and said light detector for selecting a section of said comparator mask means having sectors of a length less than the length of an aperture of said apertured material and overlaying said slotted apertured material with said selected section in a manner to provide a light transparent length of aperture less than the length of said aperture of said slotted



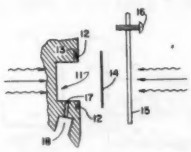
apertured material, said means responsive to a signal from said light detector representing light transmission of said slot of a given length for deriving a signal representative of the width of said slot of said slotted apertured material whereby slot length and light transmission of said slot of a given length are utilized to determine slot width.

4,533,252

DEVICE AND METHOD AND MEASUREMENT OF PHOTOSYNTHETIC ACTIVITY BY PHOTOACOUSTIC SPECTROSCOPY

David Cahen; Shmuel Malkin; Benjamin Horwitz, all of Rehovot, Israel, and Gerard Bults, Wageningen, Netherlands, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Filed May 25, 1982, Ser. No. 381,767
Claims priority, application Israel, Jun. 5, 1981, 63053
Int. Cl.³ G01N *21/24*
U.S. Cl. 356—432 **10 Claims**



1. A portable cell for measuring the photosynthetic activity of photosynthetically active tissue, comprising:

a housing, said housing being open at one end;

an acoustic transducer, located within said housing;

securing means for securing said housing, at the open end thereof, to or over a photosynthetically active specimen to be measured;

a modulated light source;

a continuous light source;

first guide means for guiding modulated light from said modulated light source toward the specimen when in use; and

second guide means for guiding continuous light from said continuous light source toward the specimen when in use.

4,533,253

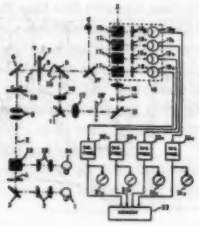
DEVICE FOR MEASURING DENSITY OF PHOTOGRAPHIC TRANSPARENCY

Takeshi Okano, Nishinomiya, Japan, assignor to Konan Camera Research Institute, Nishinomiya, Japan

Filed Sep. 7, 1982, Ser. No. 415,447
Claims priority, application Japan, Sep. 16, 1981, 56-146927
Int. Cl.³ G01N *21/59*
U.S. Cl. 356—443 **4 Claims**

1. A device for measuring density of photographic transpar-

ency, comprising a light source, a photoelectric element, at least two optical components having a polarizing feature and being disposed on a light path between said light source and photoelectric element, and a location on said light path between said optical components where a photographic transparency to be measured is to be located, optical means for restor-



ing polarized light to natural light, said means being disposed rotatably in said light path between said optical components, and the angle of rotation of said optical means being adjusted so that the amount of incident light on said photoelectric element is maximized when said photographic transparency is removed from said location.

4,533,254

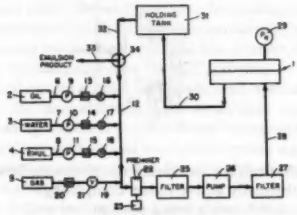
APPARATUS FOR FORMING EMULSIONS

Edward J. Cook, South Hamilton, and Arthur P. Lagace, Newtonville, both of Mass., assignors to Biotechnology Development Corporation, Newton Upper Falls, Mass.

Division of Ser. No. 255,239, Apr. 17, 1981,. This application Feb. 21, 1984, Ser. No. 581,568

Int. Cl.³ B01F *5/06*

U.S. Cl. 366—176 **19 Claims**



1. A liquid jet interaction chamber block for forming an emulsion, comprising in combination

(a) a plurality of submerged nozzles providing elongated orifices arranged to eject under pressure a plurality of thin sheets of an emulsion-forming liquid system, said nozzles being arranged to effect turbulent jet interaction of said sheets along a common liquid jet interaction front and said sheets being ejected by said nozzles into a low pressure zone filled with said liquid further creating turbulent jet interaction along a common boundary essentially defined and formed by said mixture in said low pressure zone and by said sheets ejected into said low pressure zone;

(b) jet interaction chamber-defining means arranged to provide said low pressure zone of said liquid system in which said turbulent jet interaction is effected;

(c) inlet channel means to deliver said liquid system under pressure to said nozzles; and

(d) discharge channel means to withdraw said liquid in the form of an emulsion from said zone.

4,533,255

PROCESS FOR MIXING LIQUID SAMPLES TO BE ANALYZED, AS WELL AS APPARATUS FOR PERFORMING THIS PROCESS

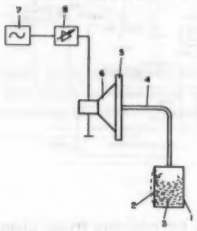
Claus Gronbolz, and Hartmut Schmidt-Rabenau, both of Hamburg, Fed. Rep. of Germany, assignors to Eppendorf Geratebau Netheler & Hinz GmbH, Hamburg, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,674

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1982, 3224583

Int. Cl.³ B01F *13/02, 11/00*

U.S. Cl. 366—108 **9 Claims**



1. A process for mixing liquid samples to be analyzed, in which a liquid sample is placed in a sample container adjacent to and moved and mixed by an air column, the air column being mechanically oscillated and in contact with at least part of the liquid sample surface, wherein the air column is excited with a frequency that causes the system, comprising the air column and the sample liquid, to resonate.

4,533,256

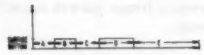
DIVE TIMER

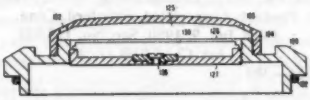
Larry P. Ostendorf, McCordsville, Ind., assignor to Divers Supply Co., Inc., Indianapolis, Ind.

Filed Dec. 29, 1983, Ser. No. 566,571

Int. Cl.³ G04F *8/00*

U.S. Cl. 368—111 **31 Claims**





1. A dive timer for divers, comprising:

(a) means for detecting submergence of said dive timer at a predetermined dive depth;

(b) programmed measuring means coupled to said detecting means for measuring bottom time, said programmed measuring means including electronic memory means for storing measured bottom time, said programmed measuring means being operative to store a first measured bottom time from a first dive in said memory means while measuring a second bottom time from a second dive;

(c) display means for providing a display of bottom time; and

(d) programmed circuit means for recalling said first bottom

time from said memory means and supplying said first bottom time to said display means after said second diver is initiated.

4,533,257

ANALOG ELECTRIC TIMEPIECE

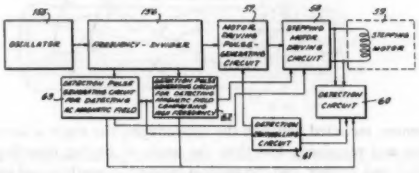
Masuo Kitano, and Masahito Yoshino, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,703

Claims priority, application Japan, Dec. 16, 1982, 57-220826; Sep. 28, 1983, 58-179839

Int. Cl.³ G04B 17/20

U.S. Cl. 368—202 **12 Claims**



1. An electric analog timepiece including:

oscillator means having a high frequency standard signal as an output;

divider means having said high frequency standard signal as an input and having a timekeeping signal of lower frequency as an output;

pulse generating means having the timekeeping signal as an input and selectively providing, as an output, driving pulses having a first width and driving pulses having a second width, the second width being greater than the first width;

an electric stepping motor having a rotor, a stator, and a coil, said rotor being driven in rotation by the application of one of said driving pulses to said coil;

means for detecting non-rotation of said rotor in response to said driving pulse;

means for detecting comparatively low frequency external magnetic fields;

means for detecting comparatively high frequency external magnetic fields; and

control means responsive to at least one of the detection of non-rotation of said rotor, the detection of a comparatively low-frequency external magnetic field, and the detection of a comparatively high-frequency external magnetic field to cause said pulse generating means to drive said stepping motor with at least one driving pulse of greater width.

4,533,258

METHOD OF DETERMINING THE CONTENT OF COMBUSTIBLES IN THE END PRODUCTS OF FUEL COMBUSTION AND APPARATUS REALIZING SAID METHOD

Boris A. Milovidov, ulitsa Kalinina, 143, kv. 25, Pavlodar, U.S.S.R.

Continuation of Ser. No. 395,465, Jul. 6, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 626,585

Int. Cl.³ G01N 25/22

U.S. Cl. 374—36 **4 Claims**

1. A method of determining the content of combustibles in the end products of fuel combustion comprising the steps of:

taking a sample of end products of fuel combustion;

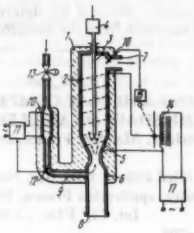
introducing said sample into a heating zone of an electric heater;

introducing an oxidizing agent into said heating zone;

heating said sample in the heating zone of said electric heater in the presence of said oxidizer to a temperature equal to or higher than the fire point of the combustibles present in said sample, ensuring the burning of said combustibles;

determining the temperature in the heating zone;

controlling said electric heater to maintain in said zone a constant temperature during the process of combustion of said combustibles in response to said determined temperature and said constant temperature;



measuring the power consumed by said electric heater in maintaining said constant temperature in said heating zone; and

determining the content of said combustibles in response to said measured power.

4,533,259

APPARATUS FOR DETECTING THE LOCAL TEMPERATURE VARIATIONS OF AN OBJECT AND THE SITES OF THE TEMPERATURE VARIATIONS

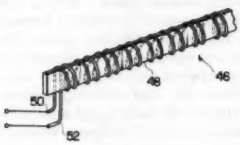
Yasushi Wakahara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 274,193, Jun. 16, 1981, abandoned. This application Jan. 9, 1984, Ser. No. 568,512

Claims priority, application Japan, Jun. 23, 1980, 55-84902; Jun. 23, 1980, 55-84905; Sep. 26, 1980, 55-132843

Int. Cl.³ G01R 31/11; G01K 7/38

U.S. Cl. 374—166 **8 Claims**



1. An apparatus for detecting a site of a temperature variation in an object, comprising:

an elongate temperature-sensing member including two elongate conductors constituting a signal transmission circuit, an insulating core in which one of said conductors is disposed, a band-shaped elongate amorphous magnetic alloy element mainly consisting of a ferromagnetic transition metal, having a prescribed Curie temperature corresponding to the lower limit of an anticipated abnormal temperature range, and disposed on said insulating core to extend therealong, and an elongate insulating layer disposed on said amorphous magnetic alloy element and said insulating core to cover them, the other of said conductors being wound about said insulating layer;

a shielding member for electromagnetically shielding said temperature-sensing member;

a pulse generator for supplying a pulse signal to one end of said temperature-sensing member;

a pulse time difference detector for detecting a time difference between a point of time at which a pulse signal is

received from said pulse generator at said one end of said temperature-sensing member and a point of time at which the pulse signal reflected from a site of said temperature-sensing member, where the characteristic impedance of said temperature-sensing member has changed due to an increase in temperature above the Curie temperature, is received at said one end of said temperature-sensing member; and

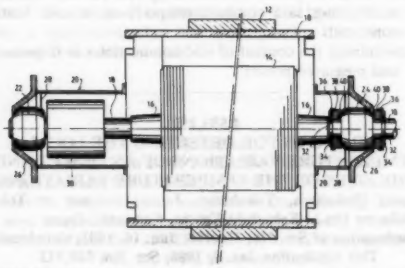
a temperature variation site detector responsive to said pulse time difference detector for determining the site of temperature variation from the detected pulse time difference.

4,533,260

POSITIONING AND PLAY-COMPENSATING DEVICE FOR THE SHAFT OF AN ELECTRIC MOTOR

Raymond Andrieux, Meudon, France, assignor to Valeo, Paris, France

Filed Feb. 9, 1984, Ser. No. 578,655
Claims priority, application France, Feb. 17, 1983, 83 02610
Int. Cl.³ F16C *25/04*
U.S. Cl. 384—206 **6 Claims**



1. A positioning and play-compensating device for a shaft of an electric motor, said shaft being guided in a swivel bearing means held by the motor casing, said device including two resilient retention members fixed to the shaft on either side of the swivel bearing means together with at least one damping washer and friction washer interposed between the retention members and the swivel bearing, means the improvement wherein at least one metal washer is mounted on the shaft, free to move axially between a corresponding one of said resilient retention members and said damping washer of rubber-like material, and wherein the face of said axially-free metal washer which is in contact with said damping washer includes axially directed projections suitable for penetrating to a variable distance into the material of the damping washer.

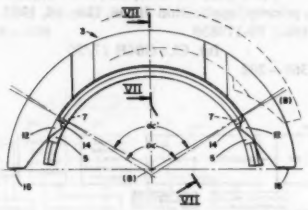
4,533,261

FLANGED HALF-BEARING FOR MOTOR APPLICATIONS

Gastone Losio, Trento, Italy, assignor to Clevite S.r.l., Trento, Italy

Filed Feb. 1, 1984, Ser. No. 575,778
Claims priority, application Italy, Feb. 3, 1983, 84909 A/83
Int. Cl.³ F16C *13/04, 33/04*
U.S. Cl. 384—296 **7 Claims**

1. A flanged half-bearing for motor applications comprising a substantially semi-cylindrical shell adapted to be fixed to a relative support with slight interference between said shell and said support, at least one axial thrust washer with generally prism-shaped hooking appendages for attachment to said shell, said shell having a curved edge in which is provided at least two cavities arranged symmetrically in relation to the axial plane of symmetry of the shell for receiving hooking appendages of said washer wherein each of said cavitites has at least one side wall having a lower part and an upper part, in which the lower part is parallel to the generatrices of the shell and the upper part is inclined toward the center of the cavity as it extends outward, the cavity having a length, in the circumferential direction, greater than the corresponding length of the appendages and partly inclined in relation to the generatrices of the shell, and a configuration such that, prior to coupling the shell and the washer, the angle at the center of curvature α, included between the cavitites, is less than the angle α' at the



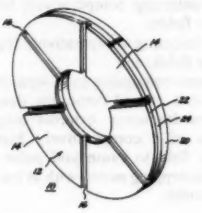
center, included between the appendages, the angle α increasing and remaining less than the angle α' during coupling of shell and washer, and the angle α becoming nearly equal to the angle α' after mounting of the half-bearing on the support by the circumferential compression action of the support on the shell, thereby providing for the shell coupling being stable before mounting on said support and partially mobile both circumferentially and axially after mounting on said support.

4,533,262

TRIMETALLIC BEARINGS

James R. Pedersen, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 534,263, Sep. 21, 1983, which is a continuation of Ser. No. 297,810, Aug. 31, 1981, abandoned. This application Sep. 12, 1984, Ser. No. 649,870
Int. Cl.³ F16C *17/02, 37/00*
U.S. Cl. 384—420 **6 Claims**



1. In a flood lubricated bearing associated with a rotatable shaft, a load-bearing element for minimizing localized peak temperatures, comprising:

an inner metallic layer having a bearing face for carrying a mechanical load transmitted from an adjacent portion of said shaft to said bearing face through an intervening lubricant film;

an outer metallic layer; and

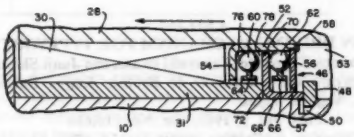
an intermediate metallic layer having higher thermal conductivity than both said inner and outer layer, respectively, said intermediate layer sandwiched between and metallurgically bonded to said inner and said outer layer and effective to maintain a substantially even temperature distribution throughout said inner layer, wherein said outer metallic layer has greater structural rigidity than both said inner and intermediate layer, respectively; wherein the thickness of said inner layer is less than the thickness of said intermediate layer and the thickness of

said intermediate layer is less than the thickness of said outer layer; and wherein such load-bearing element is fabricated as a thrust plate for a tapered land thrust bearing.

4,533,263
RADIAL BEARING AND BI-DIRECTIONAL THRUST BEARING ARRANGEMENT

Michael J. McGuffie, Harwinton, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Sep. 26, 1983, Ser. No. 535,762
Int. Cl.³ F16C *19/10, 19/49*
U.S. Cl. 384—454 **7 Claims**

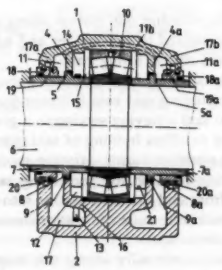


1. A radial bearing and bi-directional thrust bearing arrangement comprising: an inner-annular race; a rotatable outer member having an inside diameter larger than the outside diameter of the inner-annular race to provide an annular space; a radial roller bearing mounted in the annular space; a bi-directional ball bearing also mounted in the annular space, said ball bearing being slip fit on the inner-annular race and having a metal cup with a radially extending end flange, the metal cup securely engaging the rotatable outer member; a ball and thrust plate assembly having balls and at least one thrust plate the ball and thrust plate assembly fitting loosely in the metal cup when no axial force is exerted against the cup and an axial force on the metal cup in a predetermined axial direction causes the end flange, balls, and at least one thrust plate to come into contact to form a thrust path from the end flange through the ball and thrust plate assembly, and an axial force in the other axial direction causes the end flange to move away from such contact to break the thrust path.

4,533,264
HOUSING FOR ROLLER BEARINGS WITH LUBRICATING MEANS

Werner Haugwitz, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 17, 1983, Ser. No. 524,086
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231005
Int. Cl.³ F16C *33/66*
U.S. Cl. 384—472 **5 Claims**

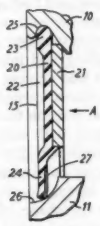


1. A housing (1,2) for rolling bearings incorporating a lubricating ring (13) which extends continuously between a lubricant storage chamber (17) beneath a shaft (6) and is driven by the shaft (6) to convey lubricant for lubricating a bearing (10), said housing (1,2) including a pair of dividing walls (4,4*a*) located on either side of the bearing extending radially relative to the bearing axis thereby defining a separate chamber (12) for the rolling bearing and chambers (11,11*a*) spaced axially outwardly of the bearing chamber (12), one of said dividing walls (4) and an outer wall (17*a*) of the housing defining the lubricant chamber (17), said one of said dividing walls being constructed integrally as one piece with the housing, and at one side of the roller bearing (10) located opposite an outer space containing the lubricant chamber (17), the other of said dividing walls (4*a*) arranged at a distance from the roller bearing (10) which together with an outer limiting wall (17*b*) at that location of the housing (1, 2) forms an outer space (11*a*) corresponding to the outer space (11) containing the lubricant chamber.

4,533,265
ROLLING BEARING ASSEMBLIES FITTED WITH SEALS

Keith W. Woodbridge, Luton, England, assignor to SKF (U.K.) Limited, Luton, England

Filed Feb. 7, 1983, Ser. No. 464,488
Claims priority, application United Kingdom, Feb. 9, 1982, 8203651
Int. Cl.³ F16C *33/78*
U.S. Cl. 384—477 **10 Claims**



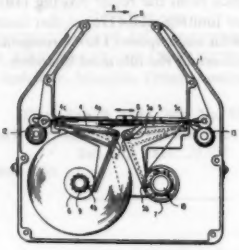
1. A rolling bearing assembly comprising a rotary component rotatably supported on another component of the assembly by a plurality of rolling bodies in an annular bearing chamber defined between the two components, and two annular seals disposed one at each end of the annular bearing chamber, each seal being mounted on one of the components and having a resilient sealing lip which is deflected by engagement with the other component in a direction away from the bearing chamber, the sealing lip under normal running conditions being in sliding sealing contact with a sealing surface on the other component, wherein part of each sealing lip is formed with one or more grooves, ribs or protrusions, and the sealing lip is deformable to bring said part thereof into contact with the associated sealing surface in response to pressure difference across the seal due to reduction of the pressure within the chamber to a value below that outside the chamber so that the grooves, ribs or protrusions permit flow of air or fluid past the seal.

4,533,266

INKED RIBBON CARTRIDGE FOR AN IMPACT SERIAL PRINTER

Shojiro Saito, and Noriyoshi Azumaya, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 434,071, Oct. 12, 1982, abandoned.
This application Oct. 16, 1984, Ser. No. 661,870
Claims priority, application Japan, Oct. 9, 1981, 56-150639[U]
Int. Cl.[3] B41J 35/28
U.S. Cl. 400—208 4 Claims



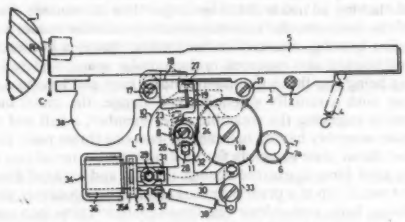
1. An inked ribbon cartridge, comprising:
an inked ribbon for use in printing by a printer;
a symmetrical casing for housing said inked ribbon, said casing including first and second sections symmetrical to each other with respect to a center line thereof;
first core means rotatably supported by said casing and disposed in said first section, said first core means having a rotational shaft, said rotational shaft including a plurality of ratchet teeth formed around its circumferential surface;
second core means rotatably supported by said casing and disposed in said second section;
driving means disposed in said second section, and driving means being used for pulling and unwinding said inked ribbon wound around said first core means and for supplying said inked ribbon for said second core means;
driven means disposed in said first section, said driven means being used for guiding said inked ribbon from said first core means toward said driving means;
a path of said inked ribbon formed in said casing, said path including an unwind portion from said first core means, a first engaging portion with said driven means, a second engaging portion with said driving means and a take-up portion to said second core means;
first L-shaped lever means consisting of first and second arms connected in the shape of an L, said lever means being rotatably supported about a rotational axis located at the connection of said first and second arms, said rotational axis being supported by a pivot formed in said casing, said pivot being positioned at a position apart from said first core means by a distance which is greater than the maximum radius of winding of said inked ribbon wound around said first core means, said first arm projecting from said rotational axis and reaching to said rotational shaft of said first core means, said second arm having substantially the same length as said first arm and projecting from said rotational axis toward said driven means and having a ribbon engaging projection on the end remote from said rotational axis;
spring means for urging said lever means in a first rotational direction such that an end of said first arm engages said ratchet teeth of said first core means to prevent the rotation of said first core means and said projection of said second arm contacts and bends said path of said inked ribbon between said unwind portion and said first engaging portion to detect a tension thereof;
said lever means being rotated in a second rotational direction opposite to said first rotational direction by the tension of said inked ribbon on the projection of said arm which contacts said ribbon to disengage said first arm from said ratchet teeth to permit the rotation of said first core means only when said inked ribbon wound around said first core means is fed by said driving means and said tension of said inked ribbon is sufficient to overcome the urging force of said spring means.

4,533,267

RIBBON DRIVING MECHANISM FOR TYPEWRITER

Hisao Kurachi; Takeo Ito; Takayuki Iwase, and Junji Shiota, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 5, 1983, Ser. No. 510,614
Claims priority, application Japan, Jul. 13, 1982, 57-122496
Int. Cl.[3] B41J 35/22
U.S. Cl. 400—214 5 Claims



1. A ribbon driving mechanism for a typewriter, comprising
a frame;
a holder supported rotatably on said frame, for holding a printing ribbon and a correction ribbon, and for selectively positioning said printing ribbon or said correction tape at a printing position;
a first urging means for normally urging said holder toward said printing position;
a ribbon lifting cam comprising a first cam section for effecting the turning of said holder to position said printing ribbon at said printing position, a second cam section extending continuously from said first cam section for effecting positioning of said correction tape at said printing position, and a relieving section extending continuously from said first cam section and along said second cam section;
a driving motor for rotating said ribbon lifting cam;
a cam follower connected to said holder and adapted to be controlled by said ribbon lifting cam;
a stopping member capable of being shifted between a working position for guiding said cam follower from said first cam section into said relieving section in a given sense of rotation, thereby to effect holding of said printing ribbon at said printing position during printing mode of operation, and a resting position for permitting said cam follower to move from said first cam section into said second cam section in said same sense of rotation during a correction mode of operation;
a second urging means normally urging said stopping member toward said working position; and
actuating means adapted to be actuated during said correction mode of operation, to shift said stopping member to said resting position, against the urging force of said second urging means.

4,533,268

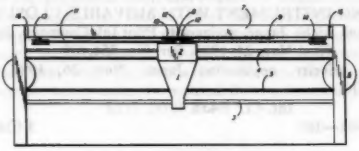
POSITION INDICATOR FOR HIGH SPEED PRINTERS

Roy C. Sanders, Jr., Burton Hwy., Wilton, N.H. 03086

Continuation of Ser. No. 436,949, Oct. 27, 1982, abandoned. This application Sep. 5, 1984, Ser. No. 647,865

Int. Cl.³ B41J *19/30*

U.S. Cl. 400—322 **8 Claims**



1. In a dot matrix printer for computer printout having an elongate platen and a print head carriage supported for relative movement therebetween longitudinally of the platen, a dot matrix print head on said carriage, said print head comprising a plurality of dot matrix print elements arranged transversely of the platen axis in a predetermined array, means for supporting said carriage for movement along said platen, means for activating said print elements at a predetermined location along said platen, means for driving said carriage with continuous motion along said platen, a position indicator, for ascertaining the position of said carriage longitudinally of said platen, comprising a rotary optical position encoder rotatably mounted on an axis fixed longitudinally of said platen, a carriage position responsive means connected to said encoder and to said carriage on opposite sides of said print head to transmit said relative movement to said encoder to rotate said encoder in synchronism with said relative movement, the connections between the print head and the responsive means being sufficiently close to said array of dot matrix print elements to accurately indicate the position of said dot matrix print head to within one or two mils of its true position despite play in the carriage support means, said position responsive means being flexible and non extensible under the forces necessary to drive said encoder and being separate from said carriage driving means, said flexible position responsive means being the sole means for driving said encoder, whereby said connections cause the encoder to accurately track the position of the dot matrix print array despite play in the carriage support, said encoder having a pattern of detectable indicia, and a detector responsive to said indicia to provide a signal indicative of the rate, amount and direction of movement rotation of said encoder, said encoder providing input to the means for activating said print elements in accordance with the indicated position.

4,533,269

WEB FEED WITH INCREMENTAL ADVANCE CONTROL FOR A PRINTER

Frederick M. Pou, Dayton, and Richard L. Straub, Miamisburg, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 393,674, Jun. 30, 1982, Pat. No. 4,442,774. This application Feb. 1, 1984, Ser. No. 575,943

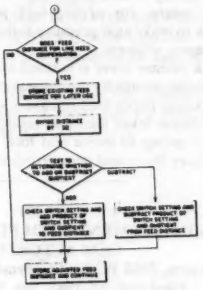
Int. Cl.³ B41J *11/42*

U.S. Cl. 400—582 **28 Claims**

1. In a printer for printing lines of information onto a web of sheet stock having means for printing the information onto the web, means for advancing the web past the printing means, and means for controlling the operation of the advancing means by providing advance signals representative of mechanical increments of advance required by the format of the information being printed, each of said increments of advance being defined by an advance signal defining a predetermined number of steps, the improvement comprising:

means for compensating for errors in the increments of advance defined by the advance signal caused by mechanical tolerances of the advancing means, said compensating means including;

means for manually entering an indication of the error in a predetermined increment of advance resulting from advancing the web a number of steps corresponding to the predetermined increment,



means responsive to both said error indication and each advance signal for compensating the advance signals to provide compensated advance signals, the amount of compensation being proportional to both the error indication and the number of steps defined by the advance signal, said advancing means being responsive to the compensated advance signals to advance the web the mechanical increments required by the format.

4,533,270

PRINTING PAPER FEED RELEASING DEVICE FOR PRINTERS

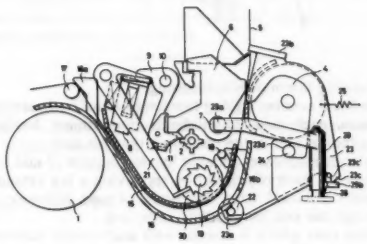
Munetaka Shimizu, Kawagoe, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,611

Claims priority, application Japan, Sep. 30, 1981, 56-145904[U]

Int. Cl.³ B41J *13/03*

U.S. Cl. 400—636 **1 Claim**



1. A printing paper feed release device for a printer, comprising:

printing paper to be printed on;

a pressure roller engageable with said printing paper to support said printing paper thereon;

a paper feed release lever means, rotatably supporting said pressure roller thereon, for selectively disengaging said pressure roller from said printing paper;

a lock release lever, engageable with said paper feed release lever means, for locking said paper feed release lever means in a position wherein said pressure roller is disengaged from said printing paper;

a supporting shaft, engageable with said lock release lever, means for reciprocating said supporting shaft in its axial

direction, said supporting shaft engaging and pivoting said lock release lever to automatically unlock said paper feed release lever means through said lock release lever when said printer is operated;

first spring means, connected to said lock release lever, for urging said lock release lever into engagement with said supporting shaft; and

second spring means, connected to said paper feed release lever means, for urging said paper feed release lever means to make said pressure roller engage with said printing paper; wherein

said lock release lever is rotated against said urging of said first spring means by movement of said supporting shaft to unlock said paper feed release lever means, and said paper feed release lever means is rotated by said urging of said second spring to move said lock release lever in a direction away from said supporting shaft.

4,533,271

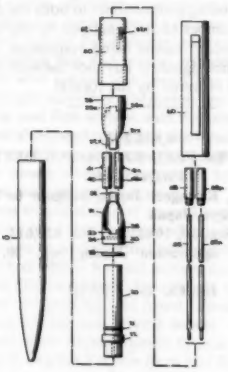
WRITING INSTRUMENT WITH PLURAL IMPLEMENTS CAM ACTUATED

Nick Sansevero, 2062 W. 4th St., Brooklyn, N.Y. 11223

Filed Oct. 12, 1983, Ser. No. 541,156

Int. Cl.³ B43K *24/10, 24/14, 27/12*

U.S. Cl. 401—29 **2 Claims**



1. A writing instrument comprising:

a cylindrical member having two longitudinal compartments therein, each said longitudinal compartment having a longitudinal slot in the periphery thereof; and

a tubular cam follower slidably located in each of said compartments, each of said followers having a lug extending radially outward from the body of said follower and through the said longitudinal slots; and

a tubular cam which is coaxial with and closely surrounds the said cylindrical member, said cam being capable of rotation about said cylindrical member, said tubular cam being formed of a lower section and an upper section, each said section having a tang projecting from the point of its longest linear dimension and each such section having a recess to accept said tang at the point of its shortest linear dimension, the said upper and lower sections being joined so as the tang of each engages the recess of the other, the said sections so joined forming two diametrically opposed helical slots in the periphery of the said tubular cam; and

a tubular retaining sleeve closely surrounding the said tubular cam; and

a lower tubular barrel with tapered lower end having a hole therein through which a writing element may project; and

two writing elements, each extending downwardly through one of said followers and through one of said compartments; and

means for securing each of said writing elements to one of said cam followers; and

a cap.

4,533,272

WRITING INSTRUMENT WITH MOVABLE CLOSURE

Kenji Sakai, Aichi, Japan, assignor to Pilot Ink Company, Japan

Filed Nov. 22, 1983, Ser. No. 554,409

Claims priority, application Japan, Nov. 26, 1982, 57-179259[U]

Int. Cl.³ B43K *9/00, 7/12*

U.S. Cl. 401—107 **3 Claims**

1. In a writing instrument with a movable closure fabricated to repeat the operation of operatively rotating a rear holder barrel (2) to actuate a cam sleeve (8) so that a writing section (19) of a writing unit is projected from an opening (1-1) in the holder barrel (1) into a writing operation and retracted and stored in an airtight condition within the barrel in a non-writing operation, said writing instrument with the movable closure including: a front holder barrel (1) with a tapered reduced diameter at its forward open-ended portion (1-1), an elastic snap member (3) including a cylinder (3-1) and a plurality of support segments (3-2) which extend from the cylinder and which are provided at one end thereof with inward covers (3-3), the snap member (3) being disposed on the inner surface of the front holder barrel (1) and being adapted to have its cylinder (3-1) loosely mounted over a first slider (4) having a forward positioned flange (4-2) for connection with the cylinder (3-1) and a rearwardly located pin (4-1), a cam sleeve (8) having cam grooves (8-1, 8-2), the cylinder (3-1) and the cam sleeve (8) being connected by a spring member (6) between the rear end of the former and the front end of the latter, the cam sleeve (8) having the front cam groove (8-1) for receiving the pin (4-1) of the slider (4), the writing unit (19) being disposed along the center axis of the holder barrel (1,2), its front end engaging a spring member (7), its rear end engaging a second slider (5), having a pin (5-1), the pin (5-1) being inserted in the cam groove (8-2), positioned at the rear of the cam sleeve, the pins (4-1) and (5-1) being arranged so that they are located in a slit (9-1) of a guide tube (9) fixed to the front holder barrel (1), whereby rotational operation of the rear holder barrel (2) in one direction causes the covers (3-3) to move into a closed position while rotation of the rear holder barrel in the opposite direction causes the covers (3-3) to be retracted causing a radial release of pressure on the support segments (3-2) causing the covers (3-3) to open simultaneously with the advance of the writing unit 19 to its projected position.

4,533,273

APPLICATOR FOR AEROSOL-TYPE CONTAINERS

Saburo Obata, Suma, and Kazuo Ito, Kamakura, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka and Toyo Seikan Kaisha, Ltd., Tokyo, both of, Japan

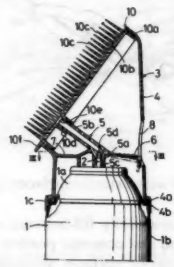
Continuation of Ser. No. 336,188, Dec. 31, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,200

Int. Cl.³ A46B *11/02*

U.S. Cl. 401—190 **2 Claims**

1. An applicator for an aerosol-type container having a container body and a movable nozzle projecting from the head of the container for discharging the contents thereof by gas pressure when the nozzle is pushed, the applicator comprising a cleaning brush and a cap including a peripheral wall fittable

to the head of the container body to surround the movable nozzle, a discharge tube disposed inside the cap peripheral wall and having one end fittable to the nozzle and extending in a direction having a radial component with respect to an axis of said nozzle, and a nozzle pushing member integral with the discharge tube, said discharge tube and pushing member being movably connected at a portion thereof by connector means to the cap peripheral wall, said connector means consisting only of a straight, flat, flexible strip, the nozzle pushing member being enclosed by said cap and being in facing relation to a finger aperture formed in the cap peripheral wall, the cap peripheral wall, the discharge tube and the nozzle pushing member being unitarily molded from substantially rigid syn-



thetic resin, the cleaning brush being fitted to the forward end of the cap peripheral wall and slidably connected to the other end of the discharge tube with a bristle side of said cleaning brush in communication with said other end of said discharge tube, said cleaning brush having bristles formed of polyethylene resin, wherein said connector means extends in a substantially radial direction with respect to said axis of said nozzle and is positioned substantially circumferentially opposite side finger aperture and substantially in alignment with said radial component of said discharge tube, with respect to said nozzle axis, and wherein said cleaning brush includes a bottom from which said bristles extend, said brush being fitted to said cap such that said bottom extends at an acute positive angle with respect to said axis of said nozzle.

4,533,274

FLEXIBLE JOINT MEANS

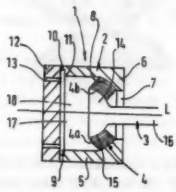
Alan F. Moore, Burbage, England, assignor to Dunlop Limited, London, England

Filed Sep. 24, 1982, Ser. No. 423,263

Claims priority, application United Kingdom, Jan. 27, 1982, 8202310

Int. Cl.³ F16D *3/80*

U.S. Cl. 403—31 **10 Claims**



1. Flexible joint means comprising a hollow outer member, an inner member having a body portion located within said outer member and a stem portion projecting outwards through an opening in said outer member, a flexible bearing of elastomeric material acting between and secured to confronting external and internal surfaces on said inner and outer members respectively for absorbing tension loads and for accommodating relative pivotal movement between said members, a fluid-tight chamber within said outer member and a substantially incompressible fluid contained within said chamber for absorbing compression loads, wherein said flexible bearing of elastomeric material is preloaded in compression by the pressure of the fluid within said chamber.

4,533,275

SWIVEL CONNECTOR FOR SECURING MOTORVEHICLE SUN VISORS

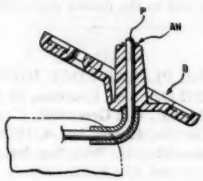
Giovanni Foggini, Turin, Italy, assignor to Lear S.n.c., Orbassano, Italy

Filed Jun. 29, 1981, Ser. No. 278,240

Claims priority, application Italy, Jul. 16, 1980, 68131 A/80

Int. Cl.³ F16D *1/12*

U.S. Cl. 403—165 **1 Claim**



1. A swivel connector for securing motorvehicle sun visors, comprising a base and a pivot pin connected together for mutual rotation under the braking effect of a frictional couple, characterized in that the pivot pin has a smooth cylindrical surface and is made of metal and simply force fitted into a seat in the synthetic resin base, and in that the ratio of the axial extension of the base-pin coupling to the pin diameter is equal to or greater than 4:1, an interference fit being provided between the pin and seat in the base in the 0.3 to 0.4 millimeter range and wherein the pivot pin has a smooth pivot pin proper portion and an extension thereof at an angle to the pivot pin proper and connected with the sun visor, said extension having along a length thereof a sleeve of elastometic material covering at least part of said extension, said sleeve having a portion extending over part of said pivot pin proper, said base having an undercut at the end of said seat facing said extension and said sleeve having its extremity facing said end of said seat in engagement of said undercut.

4,533,276

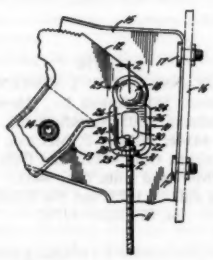
SWIVEL

Mark A. Stidham, Rockford, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jul. 13, 1984, Ser. No. 630,859

Int. Cl.³ F16D *1/12*

U.S. Cl. 403—165 **3 Claims**



1. A swivel adapted to connect a turning member to an

elongated element which is movable endwise and which has a head on its free end, said swivel being a rigid unitary sheet metal stamping and comprising, an elongated flat body portion, a hole formed through said body portion adjacent one end thereof for attaching said swivel to said turning member, an end flange projecting laterally from said body portion at the other end thereof, a pair of spaced side flanges, one projecting laterally from each side of said body portion and each merging with a side of said end flange, a window wider than the head on said elongated element and formed through said body portion adjacent the center thereof, a first slot formed through said body portion and extending longitudinally of the latter from said window to said end flange, and a second slot formed in said end flange and communicating with said first slot, said second slot having a closed end located adjacent the center of said end flange, and both of said slots being narrower than said head but wider than said element whereby the head may be inserted through said window and said element may be moved through said first slot to the closed end of said second slot.

4,533,277

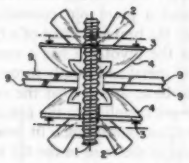
IN-PRESSING PLANAR EDGE JOINER CLAMP

Roy Alexander, 1575 Oak Ave., Evanston, Ill. 60201, and Robert Bokum, 19 Ledge Rd., Old Greenwich, Conn. 07670

Continuation of Ser. No. 45,314, Jun. 4, 1979, abandoned. This application May 11, 1982, Ser. No. 376,946

Int. Cl.³ F16B *2/00*

U.S. Cl. 403—408.1 **3 Claims**



1. A reusable panel fastener for joining panels, having adjacent notches to receive said fasteners, in an edge to edge relationship comprising:

an elongated threaded rod extending through adjacent notches in said panels and extending beyond said panels,

first and second frustoconical members of a resilient material each having a central aperture extending axially therethrough mounted with the smaller surfaces in an opposing relationship contacting said panels and a circumferential supporting surface at the larger outer end thereof,

a pair of flat metal washers, each having a central aperture minimally larger than the diameter of the threaded rod and mounted against the circumferential supporting surface of each frustoconical member, and

adjustable mounting means threaded onto both ends of the rod in contact with the washers to secure adjacent panels together by forcing said frustoconical members against said panels.

4,533,278

EXPANSION JOINT SYSTEM

William L. Corsover, 561 Haskell Dr., Akron, Ohio 44313; Kenneth P. Hoffman, 5305 Northfield Rd., #229, Bedford Heights, Ohio 44146; William F. McCann, 3542 Glencairn Rd., Shaker Heights, Ohio 44122, and Billy J. Wooden, 45 Hunting Trail, Moreland Hills, Ohio 44022

Filed Jul. 25, 1983, Ser. No. 516,509

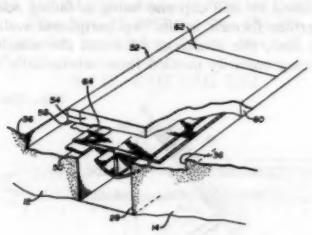
Int. Cl.³ E01C *11/10*

U.S. Cl. 404—65 **8 Claims**

1. An expansion joint system for coupling concrete segments having a slot and a boxed-out zone therebetween, such system comprising:

a plastic plate having resilient means, a support surface and a stem therebetween, said resilient means being positioned in the slot and extending outwardly in gripping contact with walls of the slot, and support surfaces having lower faces supported by the boxed-out zone and spanning the slot the plate being unattached to the segments,

a sealant slab positioned in the boxed-out zone to cover the plate and a part of the concrete with an exterior surface



substantially parallel with exterior surfaces of the concrete segments, and

nosings positioned to essentially fill between edge portions of the sealant slab and end concrete portion of the boxed-out zone, having exterior surfaces substantially parallel with exterior surfaces of the concrete segments and sealant slab.

4,533,279

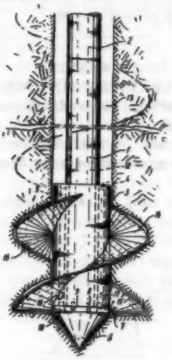
METHOD FOR MAKING A FOUNDATION PILE

Lambertus W. A. van den Elzen, Ijssel; Adriaan van der Wouden, Bergambacht, and Auke Meijer, Nigtevecht, all of Netherlands, assignors to Fundemantum B.V., Netherlands

Filed May 12, 1983, Ser. No. 494,095

Int. Cl.³ E02D *5/36*

U.S. Cl. 405—239 **5 Claims**

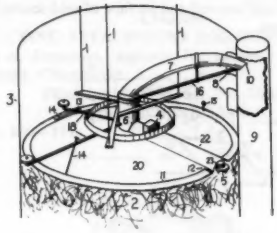


1. A tube for making a foundation pile in the soil which is vertically screwed into the soil, said tube having at least one screwing blade at its lower end, an orifice for hardenable liquid below the lower face of the blade, and a cone closing the lower end of said tube, characterized in that a cylindrical jacket is connected to the lower end of the tube by means of spacers so as to form an annular free space between the outer wall of the tube and the inner wall of the jacket, said space being open at the top and at the bottom and being in communication with the inside of the tube to supply said hardenable liquid to said space, and said blade being attached to said cylindrical jacket.

4,533,280
SURFACE REMOVAL SILO UNLOADERS

Thomas Elliott, R.D. #5, Box 298, Towanda, Pa. 18848, and Todd Knecht, Towanda, Pa., assignors to Thomas Elliott, Towanda, Pa.

Filed May 26, 1983, Ser. No. 498,305
Int. Cl.³ B65G *53/48, 65/38;* A01F *25/20*
U.S. Cl. 406—57 3 Claims



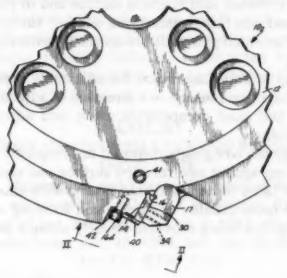
1. In a surface removal silo unloader, located within a silo for storing ensilage, the silo being of cylindrical form having a longitudinal axis and walls of circular cross-section forming the longitudinal axis, the unloader being located above the surface of the ensilage stored therein for unloading of the ensilage through doors located in the side of the silo; the unloader being of the type having a fixed portion comprising a stationary frame adapted for vertical movement along the longitudinal axis of the silo; means for supporting the frame above the surface of the ensilage; impeller means for forceably removing ensilage from under the center of the unloader, mounted on the frame means at the center thereof; chute means for guiding the ensilage removed by the impeller means to the doors in the side of the silo; and having a rotation portion comprising: gathering means for conveying ensilage from the periphery of the silo to the impeller means, mounted beneath the frame means with at least part adapted to contact the ensilage and draw it toward the impeller means, the entire gathering means being adapted for rotational movement around the longitudinal axis of the silo; the improvement comprising:

a. an ensilage cover constructed of air-impermeable thermally insulating material for limiting air contact with the surface of the ensilage, covering substantially all of the surface of the ensilage, and attached to the rotating portion of the unloader for movement therewith; comprising:
   1. first cover means closely surrounding the part of the gathering means which is not in contact with the ensilage;
   2. second cover means sealably mating with the first cover means, and comprising a circular planar sheet resting upon the surface of the ensilage, having a slot along a radius of the circle wide enough to accomodate the gathering means and first cover means;
b. the thermally insulating air impermeable material o the ensilage cover comprising a layer of insulating material between upper and lower air-impermeable layers; the air impermeable layers being plastic-coated canvas; and at least the lower air-impermeable layer being further coated with a bottom layer of material which is resistant to being adhered to by frozen ensilage;
c. the ensilage cover having an opening therein to allow unloading of ensilage through the cover;
d. seal means for limiting air flow between the cover and the circumference of the silo wall.

4,533,281
CUTTER BLADE RETENTION

Ralph W. Lacey, Grosse Pointe Park, Mich., assignor to Dijet Industrial Co., Ltd., Grosse Pointe, Mich.

Filed Oct. 14, 1983, Ser. No. 541,962
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—36 4 Claims



1. A milling cutter having insert blades free of clamping stress distortion and capable of blade axial runout variation without loosening and retightening of a clamp, comprising:

in combination with a cutter body having a back face, a front face, a generally cylindrical periphery, a center mounting bore or shank, and a plurality of circumferential, blade-receiving slots at the juncture of said periphery and said front face, to extend radially through said periphery and axially through said front face; each slot including a bottom seat, an axially extending, radially facing blade-locating surface, and a radially extending adjustable blade-seating surface; polygonal blades in said slots, each blade having a pair of flat sides, a plurality of edge surfaces and at least one cutting edge; one of said blade flat sides engaging said slot bottom seat, one of said blade edge surfaces abutting said blade-locating surface, and one of said blade edge surfaces abutting said blade-seating surface; a blade-retaining spring attached to said cutter body and bearing against a blade edge surface opposite said locating surface to retain said blade by a resilient biasing force; said spring being a leaf spring, means to secure one end of said spring to said cutter body and the other end bearing against said blade edge surface, and applying the sole radial retention for said blade, said blade being free of clamping force stress and being adjustably movable while retained by said spring; and means to adjust said blade-seating surface to vary the axial runout of said blade relative to said cutter body, while retained by the bias of said spring.

4,533,282
MILLING CUTTER

Wilhelm Lindlar, Cologne, and Günter Wermeister, Düsseldorf, both of Fed. Rep. of Germany, assignors to Santrade Limited, Lucerne, Switzerland

Filed May 24, 1983, Ser. No. 497,416
Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220363
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—38 6 Claims

1. A milling cutter comprising:

a cutter body rotatable about an axis and containing a plurality of circumferentially spaced recesses,

each said recess including a reaction surfce, a support surface and a locating surface, said locating surface having axial and radial directional components relative to said axis,

a plurality of cutting inserts supported in respective ones of said recesses,

each of said inserts comprising a pair of opposing side faces interconnected by a plurality of edge faces,

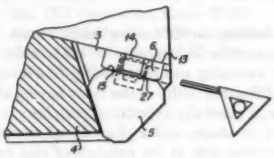
a plurality of clamp means for yieldably pressing said inserts against said support surfaces, each clamp means comprising:

a wedge member engaging one of said side faces of an associated insert, and

spring means arranged to yieldably urge said wedge member against said one side face to push one of said edge faces toward said reaction surface and to push the other of said side faces against said support surface in a direction oriented generally transversely with respect to said axis,

a plurality of adjusting means for adjustably moving respective ones of said inserts in a direction of adjustment having radial and axial components, each said adjusting means comprising:

a wedge pin wedgingly disposed in a respective recess and bearing against said reaction surface and said one of said edge faces of an associated insert, with another of said edge faces slidably engaging said locating surface, said wedge pin being movable linearly along a path oriented



parallel to said reaction surface and said support surface and at an inclination relative to said one edge face, and having radial and axial components, said wedge pin being held against rotation about said path as an axis,

said wedge pin including a laterally extending shoulder which includes a threaded bore extending substantially parallel to said path,

a threaded screw threadedly connected in said bore and aligned with a hole in said cutter body to be accessible to a tool from the outside to be rotated, means restraining said screw against movement along its longitudinal axis such that in response to rotation of said threaded screw in one direction of rotation said wedge pin is moved inwardly along said path to adjustably displace said insert outwardly along said locating surface in said direction of adjustment by means of the engagement between said wedge element and said one edge face, said insert sliding frictionally relative to said wedge member of said clamping means during displacement in said direction, with said wedge member retaining said insert in its adjusted position simultaneously with termination of said displacement.

4,533,283

TOOL HOLDER ASSEMBLY

Amir Satran, Kiriat Bialik, and Shmuel Elka, Nahariya, both of Israel, assignors to Iscar Ltd., Nahariya, Israel

Continuation of Ser. No. 314,337, Oct. 23, 1981, abandoned. This application Mar. 16, 1984, Ser. No. 590,739

Claims priority, application Israel, Oct. 29, 1981, 61368

Int. Cl.[3] B26D *1/11*

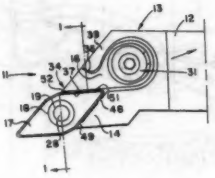
U.S. Cl. 407—111 **3 Claims**

1. A holder assembly for retaining a cutting tool having a V-shaped portion therein, comprising:

a cutting tool having a V-shaped portion and top and bottom surfaces;

a tool holder defining a recess, including a portion definable as the tool recess for receiving said V-shaped portion of said cutting tool, and having a fixed stationary post extending upwardly therefrom, with the tool having a hole extending between its top and bottom opposite surfaces whereby said tool is retainable in said tool recess by the post extending into the tool's hole and said tool holder further includes first and second stationary walls on opposite sides of said recess, said first stationary wall defining one side of said tool recess; said secondary stationary wall having a curved end surface;

clamp means in said recess and means pivotally and slidably mounting said clamp means in said recess, said clamp means including a wedge portion with a wedging wal facing said first wall and an opposite curved shaped side juxtaposed said curved end surface of said second stationary wall; and



means for displacing said clamp means to slidably move in a direction so as to wedge the curved shaped side of said wedge portion about the curved end surface of said second wall at a single point of contact, and to pivot said clamp toward said first stationary wall so that the tool becomes wedged by the post, and the V-shaped tool portion is wedged between the first stationary wall and the wedging wall of the clamp, with the angle between the first stationary wall and said wedging wall being variable to accommodate variations in the angle between the tool's walls forming said V.

4,533,284

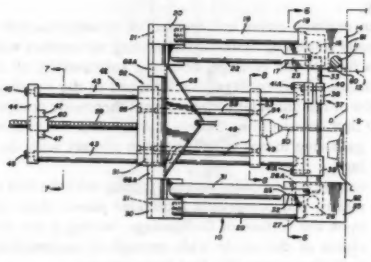
ADJUSTABLE DRILL MOUNT

Frank P. Agius, 909 Washington Ave., Alpena, Mich. 49707, and Darrell E. Sims, 4984 Haken Rd., Alpena, Mich. 49809

Continuation of Ser. No. 300,695, Sep. 10, 1981, abandoned. This application Dec. 22, 1983, Ser. No. 564,353

Int. Cl.[3] B23B *47/28*

U.S. Cl. 408—92 **20 Claims**



1. A device for adjustably supporting a power drill for drilling a safe, said device being temporarily attachable to a safe; and comprising the combination of: a pair of vertically spaced, horizontally disposed frames, vertical body members joining said horizontally disposed frames, a vertically disposed mounting frame, a plurality of elongated rods attached to said vertically disposed mounting frame and extending outwardly therefrom and a plate attached to the outer ends of said elongated rods, said elongated rods and said vertically disposed mounting frame and plate forming an elongated support movable horizontally and vertically relative to said horizontally disposed

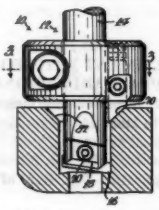
frames; means for adjustably positioning said power drill including a horizontally disposed rod in each of said horizontally disposed frames, a pair of secondary vertical body members and means on their upper and lower ends respectively slidably engaging said horizontally disposed rods, a carriage arranged to receive and hold a power drill, said carriage movably engaging said elongated support and means on said elongated support for moving said carriage relative thereto and means for temporarily clamping said horizontally disposed frames to a safe.

4,533,285

CUTTING ATTACHMENT FOR BORING TOOL

Charles A. Jorgensen, Antioch, Ill., assignor to Everede Tool Company, Chicago, Ill.

Filed Jun. 9, 1983, Ser. No. 502,502
Int. Cl.³ B23B *51/08*
U.S. Cl. 408—191 **13 Claims**



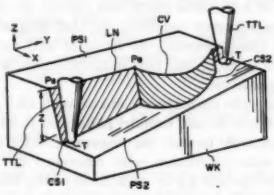
1. In combination with a boring tool having a cutting element adjacent an end of a bar for producing a hole in a working surface, a chamfering tool carried by said bar spaced from said cutting element for simultaneously producing a chamfer extending from said working surface to said hole, said chamfering tool comprising a collar having a slit dividing said collar into collar halves connected by an integral hinge with a fastener extending across said slit to releasably retain said collar on said bar, a removable cutting insert carried by said collar with a portion in said slit and having a cutting edge extending toward said end of said bar for simultaneously producing said chamber in said hole, and retainer means extending through said collar into said slit and engage said portion.

4,533,286

TOOL COMPENSATION METHOD

Hajimu Kishi, Hino; Masaki Seki, Suginami, and Masashi Kawasumi, Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP82/00085, § 371 Date Nov. 17, 1982, § 102(e) Date Nov. 17, 1982, PCT Pub. No. WO82/03473, PCT Pub. Date Oct. 14, 1982
PCT Filed Mar. 30, 1982, Ser. No. 444,592
Claims priority, application Japan, Mar. 30, 1981, 56-047048
Int. Cl.³ B23G *1/00*
U.S. Cl. 409—80 **6 Claims**



1. A tool compensation method for offsetting a tapered tool by a distance corresponding to a tool radius from a commanded tool path for cutting a workpiece, wherein the tool path has a varied depth relative to a work surface, comprising the following steps:

(a) storing data defining

(i) the inclination a° of a uniform taper of the tapered tool, and

(ii) a radius r of the tapered tool at a given height h above the tip of the tool;

(b) determining an offset value based on said data defining the inclination, said radius, and height; and

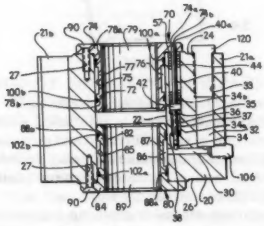
(c) offsetting the tool according to said offset value to cut the workpiece, thereby utilizing a corrected tool position dependent upon the depth of which the tool is infed.

4,533,287

CUTTER HEAD WITH LOCKING PRESSURE INDICATOR

Kenneth L. Hagemeyer, and Vernon W. Pearson, both of Rockford, Ill., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation of Ser. No. 310,171, Oct. 9, 1981, abandoned. This application Jan. 10, 1984, Ser. No. 569,691
Int. Cl.³ B23C *5/26*
U.S. Cl. 409—234 **1 Claim**



1. In a tool cutter head of the type for mounting on a machine tool spindle and having a cutter body with first and second axial ends and a central bore therebetween, a first locking collar adjacent the first axial end and a second locking collar adjacent the second axial end with each locking collar having a radial flange portion fastened to the adjacent axial end and an expandable fluid pressure receiving portion extending partially into the central bore at that end expandable by fluid pressure to lock the cutter body to the spindle, and fluid pressure means in the cutter body for applying a preselected locking pressure to the fluid pressure receiving portions, the improvement comprising portions of said cutter body forming a first axial bore in fluid pressure communication with the first locking collar fluid pressure receiving portion adjacent said first axial end and extending axially therefrom to the opposite second axial end where the first bore terminates in an open end beneath the flange of said second locking collar, other portions of said cutter body forming a second axial bore in fluid pressure communication with the second locking collar fluid pressure receiving means adjacent said second axial end and extending axially therefrom to the opposite first axial end where the second bore terminates in an open end beneath the flange of said first locking collar, portions of the first and second locking collar flanges forming apertures coaxially aligned with the open bores therebeneath and also forming outer reference surfaces around the apertures, first and second pressure indicator means sealingly disposed in the respective open bores and movable through the coaxially aligned flange apertures in response to changes in locking pressure and first and second spring means in the respective open bores for biasing movement of the first and second pressure indicator means such that said first indicator means is positioned coincident with the second locking collar flange reference surface and the second indicator means is positioned coincident with the first locking

collar flange reference surface when locking pressure is at the preselected value, whereby the first pressure indicator means together with the second locking collar flange reference surface display locking pressure for the first locking collar at the second axial end opposite from said first locking collar and the second pressure indicator means together with the first locking collar flange reference surface display locking pressure for the second locking collar at the first axial end opposite from said second locking collar.

4,533,288

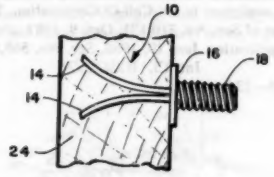
DRIVE FASTENER

Bernard W. Rivkin, Poway, and Michael R. Monfort, Ramona, both of Calif., assignors to P.P.M.D., San Diego, Calif.

Filed Jul. 29, 1982, Ser. No. 403,054

Int. Cl.³ F16B *13/06*

U.S. Cl. 411—176 **6 Claims**



1. An improved drive fastener comprising:

an elongated shank having a bifurcated end portion, the open distal end of said bifurcated end portion positioned at one end thereof and suitable for being driven into penetrable material and a threaded portion positioned at the opposite end of said shank; and

impact absorbing means comprising back-to-back nuts removably threaded on said threaded portion in a locked-together position and extending at least to the outer end thereof for receiving blows suitable for driving said drive fastener into penetrable material, the force of said blows causing the sides of said bifurcated end portion to spread apart as said fastener is driven into said penetrable material whereby the threaded portion of said fastener is not affected thereby.

4,533,289

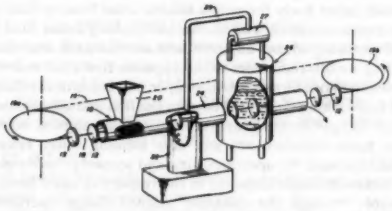
SEALING AND LIQUID DISPLACEMENT SYSTEMS FOR A LINEAR POCKET FEEDER

Adi R. Guzdar, Sudbury, Mass., assignor to Foster-Miller Associates, Inc., Waltham, Mass.

Filed Jun. 8, 1982, Ser. No. 386,256

Int. Cl.³ C10J *3/52*

U.S. Cl. 414—217 **16 Claims**



7. An improved linear pocket feeder for introducing granular solids into a vessel containing pressurized gas, the feeder having a sealed conveying tube, a plurality of pistons slidable within the tube and connected together to form pockets therebetween, means for feeding granular solids to the pockets, an unloading station for depositing the granular solids from the pockets into the pressurized vessel, means for driving the pistons through the tube in a desired direction of movement to transport the granular solids from the feeding means to the unloading station, wherein the improvement comprises:

at least one transfer tank disposed downstream from said unloading loading station with respect to the direction of movement of said pistons and through which the pistons and pockets travel;

a displacing liquid disposed within said transfer tank, said displacing liquid being less compressible than and more viscous than the gas disposed in said vessel;

means for supplying said displacing liquid to said transfer tank;

means for collecting gas displaced from said pockets by said displacing liquid;

means for conveying the displaced gas from said collecting means to said unloading station; and

means for maintaining a higher gas pressure in said transfer tank than in said unloading station.

4,533,290

FORK-LIFT ATTACHMENT WITH FOUR LATERALLY DISPLACEABLE PRONGS

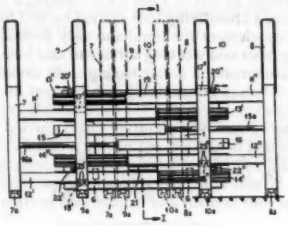
Klaus-Dieter Hackauf, Braunschweig-Timmerlah, Fed. Rep. of Germany, assignor to Hans H. Meyer GmbH Maschinenbau, Salzgitter, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 571,857

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301595

Int. Cl.³ B66F *9/12*

U.S. Cl. 414—667 **10 Claims**



1. A four-prong attachment for a fork-lift truck provided with a vertical lifting plate, comprising:

a vertical support plate attached to said lifting plate forwardly of a front face thereof;

two outer prongs and two inner prongs of generally L-shaped structure with upright legs lying in a plane forward of said support plate, the upright leg of each outer prong being provided with a pair of vertically separated horizontal mounting rails extending toward the other outer prong, said pairs of mounting rails being relatively offset in the vertical direction;

two pairs of horizontal guide rails fixedly mounted in vertically spaced-apart positions on said support plate with profiles complementary to those of said mounting rails, each pair of mounting rails slidably engaging a respective pair of guide rails;

two fluidic jacks respectively linked with said outer prongs and anchored to said support plate, said jacks being selectively operable to shift the respective outer prongs laterally in either direction with reference to said support plate, the upright leg of each inner prong being provided with holding means frictionally engaging the pair of mounting rails secured to the respectively adjoining outer prong for bidirectional entrainment by the latter upon a shifting thereof by the respective jack; and

abutment means carried on said support plate for arresting said inner prongs in internal and external limiting positions while enabling further shifting of said outer prongs by said jacks.

4,533,291

TURNOVER DEVICE

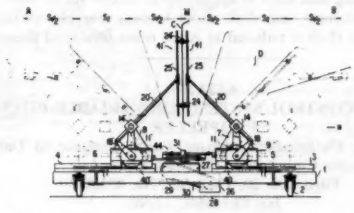
Kenji Nishida, Matsuto, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,138

Claims priority, application Japan, Aug. 10, 1983, 58-123231[U]

Int. Cl.³ B65G *47/24*

U.S. Cl. 414—728 **4 Claims**



1. A turnover device adapted to receive a workpiece at its inlet end and deliver the workpiece in a turned over state from its outlet end at a distance from the inlet end, comprising a main body frame, first and second carriers supported on said main body frame so as to be movable in the inlet-outlet direction, first and second arm holders rotatably supported by said first and second carriers, respectively, first and second arm rods slidably held by said first and second arm holders, respectively, first and second workpiece holders fixedly secured to one end of said first and second arm rods, respectively, and adapted to detachably hold the workpiece, first and second crank drive mechanisms associated with said first and second carriers, respectively, and adapted to rock said first and second arm rods, respectively, in the inlet-outlet direction when said carriers are moved in the inlet-outlet direction, and carrier drive means for driving said first and second carriers simultaneously in the opposite directions so that they may approach to each other and they may separate from each other.

4,533,292

TURBINE ROTATABLE IN ONE DIRECTION IN A RECIPROCATING FLOW

Masahiro Sugihara; Etsuo Morishita; Tetsuo Hirai, and Shin Sekiya, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,551

Claims priority, application Japan, Jun. 17, 1982, 57-106031

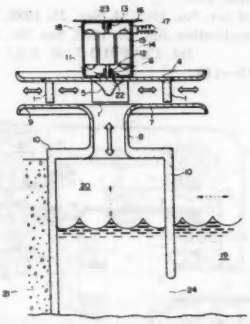
Int. Cl.³ F01D *5/04*; F03B *13/12*

U.S. Cl. 415—2 R **21 Claims**

1. A turbine rotatable in one direction in a reciprocating flow, comprising:

a rotary shaft;

a rotary pedestal fixed to said rotary shaft and provided with a plurality of rotor blades having a zero lift plane on a circular surface coaxial with said rotary shaft, said circular surface being generated by rotating a straight line about said rotary shaft, said straight line held at a non-zero angle to a plane, said plane intersecting said rotary shaft at a perpendicular angle; and



means for directing said reciprocating flow radially outward and radially inward when viewed from the center of rotation.

4,533,293

METHOD OF IMPROVING THE PART-LOAD BEHAVIOR OF A TURBO MACHINE, AND A COMPRESSOR OR PUMP ADAPTED FOR USE OF SUCH METHOD

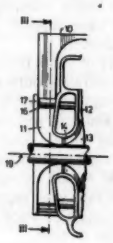
Rudolf Hendriks, Velp, Netherlands, assignor to Thomassen International, Netherlands

Filed Dec. 21, 1982, Ser. No. 452,022

Claims priority, application Netherlands, Dec. 22, 1981, 8105790

Int. Cl.³ F04D *29/68*

U.S. Cl. 415—117 **9 Claims**



1. A turbo machine adapted for use as a compressor or a pump, comprising:

a housing provided with an inlet and an outlet;

at least one driven rotor provided with rotor vanes in said housing, by means of which a free vortex flow of fluid is displaced in a path from the inlet to the rotor vanes without deflection by other vanes in said path, and then brought to a higher pressure level, and is finally discharged from the housing through the outlet; and

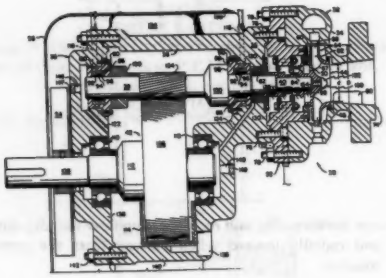
injection means provided in the region of the inlet for injecting extra fluid into the path of fluid from the inlet to the rotor, said injection means including a plurality of nozzles disposed in an annular array positioned concentrically with respect to the axis of the rotor at a greater distance than said rotor vanes from said axis, at least the majority of said nozzles being spaced substantially the same distance from said axis.

4,533,294

HIGH SPEED CENTRIFUGAL PUMP AND METHOD FOR OPERATING SAME AT REDUCED NOISE LEVELS

Hasan F. Onal, Denver, Colo., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 190,754, Sep. 25, 1980, abandoned. This application Jun. 20, 1983, Ser. No. 506,150
Int. Cl.[3] F01D 5/08, 5/02
U.S. Cl. 415—119 12 Claims



1. A single stage, single suction, high speed centrifugal pump comprising:

(a) a pump housing, said housing including a double volute portion,

(b) a bearing housing,

(c) a shaft mounted for rotation within said bearing housing with a portion of said shaft extending into said pump housing,

(d) means for rotating said shaft about an axis, said rotating means including a single-step helical gear arrangement,

(e) a closed Francis-van impeller mounted on said portion of the shaft extending into said pump housing for rotation therewith about the rotational axis of the shaft, said impeller having:

(i) an inlet eye having an inlet diameter,

(ii) a longitudinally extending hub portion and a radially extending vane support portion having an outer discharge diameter,

(iii) a plurality of vanes fixed to said vane support portion, said vanes spiraling outwardly to the outer periphery of said vane support portion and having leading and trailing edges and lead and trail angles,

(iv) an annular shroud fixed to said vanes,

(v) the lead angle of each leading edge of said vanes being about 60°40′ at said shroud and varying continuously to about 8° at said vane support portion,

(vi) the trail angle of each vane being about 16° at the trailing edge thereof,

(vii) each of said vanes having an angular extent of approximately 210° about the rotational axis of the impeller, and

(viii) each of said vanes being equally spaced peripherally about said impeller

(f) said double volute portion of said pump housing being mounted about said impeller to receive the discharge therefrom and having an inlet flow passage means with a portion thereof axially aligned and in fluid communication with the eye of the impeller,

(g) the ratio of the outer discharge diameter of said vane support portion to the inlet diameter of said impeller eye being at least approximately two, and

(h) means for controlling axial thrust along said shaft, said controlling means including:

(i) a pair of wear rings of predetermined diameter relative to each other formed between the pump housing and said impeller for separating the inlet pressure from the discharge pressure, and

(ii) at least one opening formed through said impeller, wherein said bearing housing includes a plurality of fins mounted thereon and extending outwardly of said bearing housing, and further including a fan mounted for rotation with said helical gear arrangement to drive ambient air by said fins whereby said bearing housing is air-cooled and the noise of said pump is attenuated.

10. A method for reducing the operating noise level of a single stage, single suction, high speed centrifugal pump for liquids operating at speeds up to 20,000 RPM, said method including the steps of:

(a) mounting a Francis-vane impeller including a radially extending vane support portion having an outer discharge diameter at least approximately twice the inlet diameter of the inlet eye of the impeller in an overhung manner on a first portion of a shaft within a double volute pump housing,

(b) rotatably mounting a second portion of said shaft within a bearing housing,

(c) driving said shaft at speeds up to 20,000 RPM, and

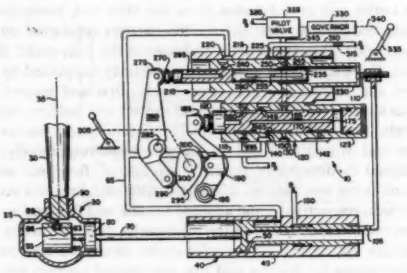
(d) maintaining said shaft under tension whereby vibration of said shaft is reduced as is the noise produced thereby.

4,533,295

PITCH CONTROL SYSTEM FOR VARIABLE PITCH PROPELLER

Jerome G. Duchesneau, Andover, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1982, Ser. No. 451,637
Int. Cl.[3] B64C 11/40
U.S. Cl. 416—27 12 Claims



1. A pitch control system for a variable pitch propeller powered by an engine the output power of which is adjusted by a power lever, said pitch control system including an hydraulic actuator connected to the blades of said propeller for movement thereof in a pitch change direction, a propeller speed governor operating a pilot valve which provides an hydraulic signal indicative of desired propeller speed at engine power greater than a select power, said pitch control system being characterized by:

a first control valve set by said power lever for selectively applying said hydraulic speed signal to said actuator, said actuator adjusting the pitch of said blades in response to said hydraulic speed signal;

said first control valve including means for selectively blocking said speed signal from said actuator in response to a predetermined setting of said engine power lever corresponding to said select engine power setting; and

a second control valve, said second control valve, at a range of settings of said engine power lever corresponding to engine output powers of lesser magnitude than said select power, being hydraulically biased into operative connection between said engine power lever and said actuator for setting said actuator to control the pitch of said propeller blades by adjustment of said engine power lever at said

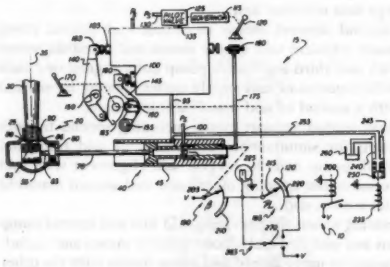
range of settings thereof independently of the operation of said governor and said pilot valve.

4,533,296

PITCH CONTROL SYSTEM FOR VARIABLE PITCH PROPELLER

Jerome G. Duchesneau, Andover, and Robert A. Schwartz, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 7, 1983, Ser. No. 549,537
Int. Cl.³ B64C *11/40*
U.S. Cl. 416—46 **7 Claims**



1. A pitch control system for variable pitch propeller powered by an engine, said pitch control system including means for controlling blade pitch in response to the output power of said engine being in a first range corresponding to a first range of blade pitch angle settings greater than a predetermined low pitch angle; beta means for controlling blade pitch in a second range of blade pitch angle settings less than said low pitch angle; and a mechanical low pitch stop for preventing control of blade pitch within said second range by other than said beta means, said system being characterized by an electrically operated backup for said mechanical low pitch stop, said backup comprising:

a voltage source;

a first switch actuatable by adjustment of blade pitch to angles less than said low pitch angle;

a second switch actuatable by adjustment of engine power to levels within said first range thereof; and

electrically operable means for adjusting the pitch of said propeller blades, said electrically operable pitch adjusting means being adapted for connection to a voltage source and actuation thereby for driving said blades toward feather by actuation of said first and second switching means under conditions of a malfunction of said mechanical low pitch stop.

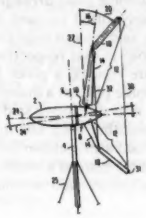
4,533,297

ROTOR SYSTEM FOR HORIZONTAL AXIS WIND TURBINES

David A. Bassett, 1708 Corwin Dr., Silver Spring, Md. 20910

Filed Sep. 15, 1982, Ser. No. 418,554
Int. Cl.³ F03D *1/06*
U.S. Cl. 416—132 B **31 Claims**

1. A rotor system for horizontal-axis wind turbines, including a rotor hub, a blade having an inner component mounted on said rotor hub to form a first fixed coning angle relative to a reference plane of blade rotation and an outer component extending from said inner component and ending in a blade tip, said outer component forming a second fixed coning angle



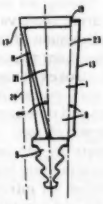
greater than said first coning angle relative to said reference plane of blade rotation.

4,533,298

TURBINE BLADE WITH INTEGRAL SHROUD

Albert J. Partington, and Ronald E. Warner, both of Media, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 2, 1982, Ser. No. 446,093
Int. Cl.³ F01D *5/22*
U.S. Cl. 416—191 **4 Claims**



1. A plurality of rotatable blades to be disposed in a circular array on a turbine rotor, said blades comprising a root portion which fastens said blades to said rotor, an air foil shaped blade portion having a leading edge and a trailing edge and a shroud portion made integral with the blade portion and disposed on the radially outer end of the blade portion;

said shroud portion having a first planar surface and a second planar surface, the first planar surface being disposed generally parallel to an axial radial plane passing through the central portion of the root portion and the second planar surface if extended forming an angle with said axial radial plane generally equal in degrees to 360 divided by the number of blades forming said circular array.

4,533,299

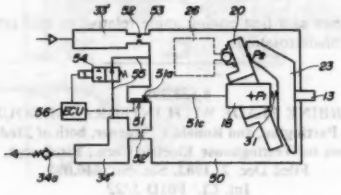
VARIABLE CAPACITY WOBBLE PLATE COMPRESSOR WITH PROMPT CAPACITY CONTROL

James C. Swain, and David L. Thomas, both of Columbus, Ohio, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed May 9, 1984, Ser. No. 608,566
Int. Cl.³ F04B *1/26*
U.S. Cl. 417—222 **11 Claims**

1. A variable capacity wobble plate compressor comprising: a housing defining therein a crankcase, a lower pressure space, and a higher pressure space; a drive shaft rotatably disposed in said housing; a cylinder block arranged in said housing and defining therein a plurality of cylinders circumferentially arranged around said drive shaft and extending substantially parallel to the axis of said drive shaft, each of said cylinders having an interior thereof disposed for communication with said lower pressure space and said higher pressure space; pistons received in respective ones of said cylinders for recipro-

cating motions therein; said crankcase having an interior thereof disposed to be supplied with blow-by gas from said cylinders when said pistons thereof are on compression and suction strokes; a wobble plate arranged in said crankcase and pivotally and slidably fitted on said drive shaft for rotation together therewith, said pistons engaging said wobble plate for reciprocating motions in said respective ones of said cylinders as said wobble plate rotates; a pivot forming a first fulcrum supporting said wobble plate at a diametrically central location thereof and axially movable along said drive shaft; and an arm member rotatable together with said drive shaft about the axis of said drive shaft, said arm member forming a second fulcrum supporting said wobble plate at a location radially spaced from said drive shaft, whereby said second fulcrum is rotatable



about the axis of said drive shaft together with said arm member; said wobble plate having an angle of axial inclination thereof relative to said drive shaft variable about said second fulcrum for varying displacement of said pistons in response to the difference between resultant reaction force exerted by said pistons on compression strokes thereof and pressure in said crankcase acting upon said pistons as back pressure; a first passage having an orifice and communicating said lower pressure space with the interior of said crankcase for permitting escape of internal pressure in the latter into the former; a second passage communicating said higher pressure space with the interior of said crankcase for introducing internal pressure in the former to the latter; and a control valve means for controlling the opening of said second passage.

4,533,300

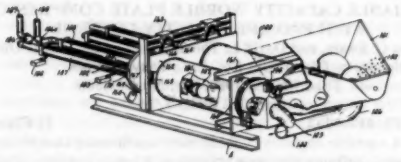
HIGH PRESSURE PUMPING APPARATUS FOR SEMI-FLUID MATERIAL

Robert E. Westerlund, 10409 N. Westview 41W, Mequon, Wis. 53092, and Wayne L. Read, West Bend, Wis., assignors to Robert E. Westerlund, Mequon, Wis.

Continuation of Ser. No. 366,596, Apr. 8, 1982, abandoned, which is a continuation of Ser. No. 112,420, Jan. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,301, Jun. 11, 1979, Pat. No. 4,345,883. This application Jun. 15, 1984, Ser. No. 620,898

Int. Cl.[3] F04B *15/02*

U.S. Cl. 417—339 **9 Claims**



1. A continuous flow pumping system for high pressure pumping a semi-fluid material with a substantially constant and uniform pressure discharge, comprising

(a) a supply means having a power discharge means for forcing of the material from said supply means, said supply means having at least two spaced outlet opening means,

(b) a manifold means having at least two spaced inlet means connected to a common output means for establishing an output flow,

(c) a first pump means having first and second pump units separately operable to receive said material and to discharge said material,

(1) first support means mounting said first pump means adjacent said supply means and said manifold means with said first and second pump units aligned one each with a first of said outlet opening means and with a first of said manifold inlet means,

(2) said first support means including first transfer means for simultaneous movement of said first and second pump units to reverse said alignment with said first outlet opening means and said first manifold inlet means,

(d) a second pump means having third and fourth pump units separately operable to receive said material and to discharge said material, and

(1) second support means mounting said second pump means adjacent said supply means and manifold means with said third and fourth pump units aligned one each with a second of said supply outlet opening means and with a second of said manifold inlet means,

(2) said second support means including second transfer means for simultaneous movement of said third and fourth pump units to reverse said alignment with said second outlet opening means and said second manifold inlet means, and

(e) operating means for operating said first and second pump means and said first and second transfer means and including means to move one of said pump means with the other of said pump means held in position, and establishing alternating pumping cycles, each of which has three distinct pumping stages and with one cycle including a first stage in which said first pump means is positioned and discharging the first pump unit and charging the second pump unit with the second pump means completing the discharge of the third pump unit and the charging of the fourth unit and a second stage in which said first pump means continues to operate in the mode of the first stage and said second pump means is being transferred to reverse the position of the third and fourth pump units, and a third stage in which said first pump means continues to operate in the mode of the first stage and said second pump means is actuated to charge and discharge the third and fourth pump units and with the alternate second pumping cycle corresponding to said one cycle with said first and second pump means operating in the mode of the opposite pump means in said one cycle.

4,533,301

PUMP

Leslie W. Foster, 2154 Sheridan Hills Rd., Wayzata, Minn. 55391

Continuation of Ser. No. 484,473, Apr. 13, 1983, abandoned. This application Sep. 17, 1984, Ser. No. 650,998

Int. Cl.[3] F04B *43/00*; **F01B** *31/10*

U.S. Cl. 417—437 **6 Claims**

1. A pump particularly adapted to produce a reliable highly pressurized liquid flow, said pump comprising:

an upper housing,

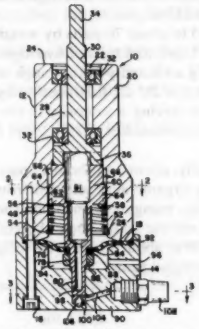
a lower cylinder connected to said housing,

a diaphragm interfacing between said housing and said cylinder to form a seal therebetween,

a drive shaft journaled in bearing means carried in a drive shaft chamber of said housing, said drive shaft having an end extending from said housing for connection with a source of rotary power and an opposite end formed with a camming surface,

a reciprocating member having an upper part slideably disposed in a lubricated reciprocating member chamber connecting with said drive shaft chamber in said housing

and supported on a spring carried in said pump with an outer surface of said member upper part fitting snugly in said chamber, said reciprocating member having a camming surface engaging with said drive shaft camming surface to produce a force continually aligned with a longitudinal axis of said member to move said reciprocating member in a first direction in alignment with said axis and compress said spring and free said reciprocating member to allow said spring to move said reciprocating member in a second opposite direction, said fit between said member upper part and said chamber having a length greater than said cam induced movement of said member, said member having a lower end extending beyond said diaphragm and including a piston positioned in a piston chamber in said cylinder with a diameter of said member upper part being greater than a diameter of said piston, and a set of slides on said member upper part with said



slides fitting within grooves in said member chamber to inhibit rotation of said member,

inlet and outlet valving devices connecting with said piston chamber to allow a flow of said liquid into and from said chamber, and

an overflow chamber in said cylinder and connecting with said piston chamber to receive liquid bypassing said piston with said overflow chamber connectable to a source of said liquid to provide for a return to said source,

wherein during operation of said pump, rotation of said drive shaft at about 800 rpm. reciprocates said reciprocating member to produce a liquid flow from said pump at pressures proximately 2500 psi., said fit between said member upper part and said member chamber and said alignment of said moving force promoting lineal alignment between said piston and said piston chamber to minimize wear between said piston and said piston chamber as said piston reciprocates therein.

4,533,302

GEROTOR MOTOR AND IMPROVED LUBRICATION FLOW CIRCUIT THEREFOR

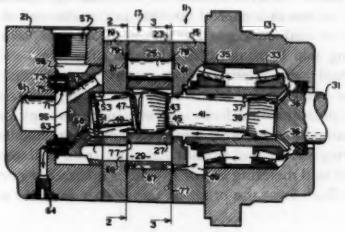
Benjamin D. Begley, Shawnee, Okla., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 17, 1984, Ser. No. 581,487

Int. Cl.³ F03C *2/08*

U.S. Cl. 418—61 B **19 Claims**

1. A rotary fluid pressure device of the type including housing means defining fluid inlet means and fluid outlet means; a gerotor gear set associated with said housing means and including an internally-toothed ring member, and an externally-toothed star member eccentrically disposed within sand ring member for relative orbital and rotational movement therein, said ring member defining a plurality of internal teeth, said internal teeth and the teeth of said star member interengaging to define expanding and contracting fluid volume chambers during said movement of said star member; valve means providing fluid communication between said fluid inlet means and said expanding volume chambers and between said contracting volume chambers and said fluid outlet means; input-output shaft means and main drive shaft means operable to transmit said rotational movement between one of said toothed members having rotational movement and said input-output shaft means; said main drive shaft means cooperating with said one of said toothed members to define first tongue transmitting drive means and cooperating with said input-output shaft means to define second torque transmitting drive means; means defining a lubrication flow path including said first and second torque transmitting drive means and means providing a generally continuous flow of lubrication fluid to said lubrication flow path, characterized by:



(a) said lubrication fluid providing means comprising each of said internal teeth including an axial end surface, said end surfaces cooperating with a first adjacent end surface of said housing means to define a first plurality of side clearance spaces, said first adjacent end surface defining a plurality of lubricant recesses, each of said recesses having a substantially greater axial extent than said clearance spaces and being disposed adjacent the radially outermost portion of said axial end surfaces of said respective internal teeth said side clearance spaces and said plurality of lubricant recesses providing fluid communication between said fluid volume chambers and said lubrication flow path.

4,533,303

HYDROSTATIC CONTROL DEVICE, PARTICULARLY STEERING DEVICE

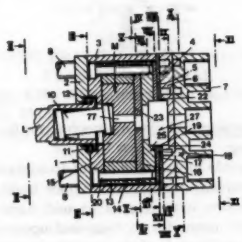
Hans C. Petersen, Nordborg; Erik Kyster, Augustenborg, and Svend E. Thomsen, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Nov. 21, 1983, Ser. No. 550,319

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1982, 3243400

Int. Cl.³ F03C *2/08*; F16H *31/02*

U.S. Cl. 418—61 B **11 Claims**



1. A hydrostatic steering control device, comprising, a housing have a plurality of ports including inlet and outlet ports and two motor ports connectable to an external servomotor, a metering motor having a casing rotatably mounted in said

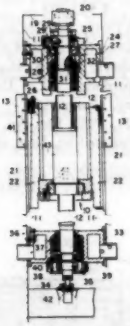
housing, a rotor mounted in said metering motor casing and being moveable relative thereto to form expansible and collapsible chambers, control shaft means for actuating said rotor, directional valve means for selectively directing pressurized fluid to and draining fluid from said motor ports, said directional valve means having opposite turn functions, said directional valve means having axially abutting planar faces respectively on said housing and said metering motor casing and being operable upon said shaft turning said casing and said rotor in unison, commutating valve means for selectively directing pressurized fluid to and drainage fluid from said motor means to impart directional movement thereto pursuant to the operation of said directional valve means, said commutating valve means being between said metering motor casing and said rotor, resilient means for maintaining said directional valve means in a neutral position in the absence of a turning force on said shaft, passage means cooperable with and connecting said housing ports with said directional valve means and said commutating valve means, said directional valve means being operable for each said turning function to (1) route pressure fluid from said inlet port through one side of said commutating valve means to expanding chambers of said metering motor and pressurized fluid from collapsing chambers of said metering motor to one of said motor ports and (2) route fluid from the other of said motor ports to said outlet port.

4,533,304

MOLD OPENING AND CLOSING MECHANISM FOR A TIRE VULCANIZER

Itaru Amano, Kobe, and Seisuke Fukumura, Hyogo, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 25, 1984, Ser. No. 603,892
Int. Cl.³ B29H *5/02*
U.S. Cl. 425—32 **4 Claims**



1. A mold opening and closing mechanism for a tire vulcanizer, comprising:

an upper movable mold and a lower fixed mold;

means for vertically moving said upper mold to open and closed positions with respect to said fixed lower mold wherein said means for moving said upper mold further comprises a ball-screw shaft assembly including a reversibly rotatable screw shaft and a threaded nut vertically movably and threadedly engaged with said screw shaft through a ball member; and

resilient buffer means resiliently supported on both upper and lower ends of the screw shaft.

4,533,305

SURFACE TREATED TIRE CURING BLADDER, TREATMENT COMPOSITION THEREFOR AND METHOD FOR CURING TIRES

Louis F. Comper, and Robert F. Scheiderich, both of Danville, Va., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 440,127, Nov. 8, 1982, abandoned, which is a continuation of Ser. No. 208,612, Nov. 20, 1980, Pat. No. 4,359,340. This application Sep. 17, 1984, Ser. No. 651,649
Int. Cl.³ B29D *29/00*
U.S. Cl. 425—43 **3 Claims**

1. A cured, rubber, expandable tire cure bladder having a coating on its outer exposed surface, where said coating consists essentially of the product of a mixture of:

(i) about 20 to about 40 parts by weight hydroxyl capped polydimethylsiloxane characterized by having a viscosity in the range of about 12 million to about 28 million centistokes at 25° C.;

(ii) about 35 to about 70 parts by weight of at least one silane selected from (a) a methyl hydrogen silane, characterized by having a viscosity in the range of about 20 to about 40 centistokes at 25° C., (b) dimethyl hydrogen silane characterized by having a viscosity in the range of about 80 to about 120 centistokes at 25° C. and (c) methyl trimethoxy silane;

(iii) optionally, about 3 to about 12 parts by weight of a metal salt of an organic acid selected from at least one of zinc, magnesium, manganese and cobalt acetate, stearate, propionate, glutonate and actoate thereof; and

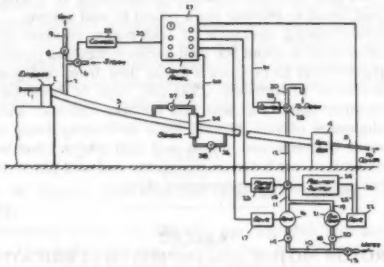
(iv) about 10 to about 25 parts by weight surfactant for said polydimethylsiloxane.

4,533,306

APPARATUS FOR MAINTAINING LEVEL OF LIQUID-GAS INTERFACE IN A VULCANIZING TUBE

John C. Frederick, Yuba City, Calif., assignor to Pirelli Cable Corporation, Union, N.J.

Filed Oct. 31, 1983, Ser. No. 546,857
Int. Cl.³ B29H *5/28*
U.S. Cl. 425—71 **14 Claims**



1. A catenary tube vulcanizer for vulcanizing extruded vulcanizable stock, said vulcanizer having a catenary tube through which the vulcanizable stock is passed and having a level control, a cooling medium supply line connected to one part of said tube, said vulcanizer further comprising:

a heating medium control valve on said heating medium line for controlling the supply of heating medium to said one part of said tube;

a cooling medium control valve on said cooling medium supply line for controlling the supply of cooling medium to said another part of said tube;

said level control comprising a magnetic float responsive to the level of said cooling medium in said tube and hence, to the interface between said cooling medium and said heat-

ing medium, and multiple switches controlled in accordance with the position of said float;

said cooling medium control valve having a bi-directional drive means for opening and closing said cooling medium control valve, said drive means being connected to said level control such as to be drivable one direction to close the water supply valve at a high cooling medium level and in another direction to open the cooling medium control valve upon occurrence of a low cooling medium level; and

said heating control medium valve also being connected with said level control for control of said heating medium valve by said level control.

4,533,307

APPARATUS FOR PREPARING THIN GEL SLABS FOR ELECTROPHORESIS

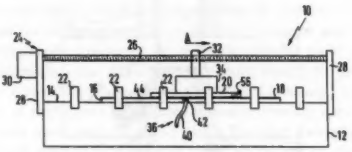
Wilhelm Ansorge, Heidelberg, Fed. Rep. of Germany, assignor to Europaisches Laboratorium fur Molekularbiologie (EMBL), Fed. Rep. of Germany

Division of Ser. No. 275,894, Jun. 22, 1981, Pat. No. 4,460,525. This application Jan. 27, 1984, Ser. No. 574,357

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024288

Int. Cl.³ B29C *15/00*; **B01D** *59/42*

U.S. Cl. 425—90 **20 Claims**



1. An apparatus for preparing a thin layer of a thickness and a material useful in electrophoresis, comprising:

(a) an elongate horizontal support having opposed sides;

(b) a bottom mold element supported on said support;

(c) opposed guide means on opposite sides of said support;

(d) a top mold element disposed between said guide means parallel to and spaced a distance equal to the thickness to a layer useful in electrophoresis from said bottom mold element for longitudinal movement over said bottom mold element; and

(e) a drive operatively attached to said top mold element for moving said top mold element relative to said bottom mold element in a forward direction parallel to said support.

4,533,308

MULTIMANIFOLD EXTRUSION DIE AND COEXTRUSION PROCESS

Peter Cloeren, 2206 N. 16th St., Orange, Tex. 77630

Continuation-in-part of Ser. No. 600,961, Apr. 16, 1984, abandoned. This application Apr. 27, 1984, Ser. No. 604,995

Int. Cl.³ A21C *3/00*

U.S. Cl. 425—131.1 **5 Claims**

1. A multimanifold extrusion die for minimizing or eliminating the curtaining effect that moreover automatically provides for convergence of molten thermoplastic streams at substantially equal flow velocities, said multimanifold extrusion die comprising

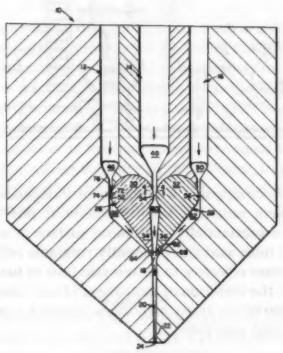
(a) a first and a second flow channel, which traverse said die and eventually converge at a point of convergence within said die; and

(b) free floating, pivoting divider means disposed between said flow channels;

wherein each of said flow channels comprises a manifold chamber situated upstream from said divider means, and further comprises in descending downstream order, a pressure compensating restriction channel, an expansion chamber, and a tapered flow restriction channel; said pressure compensating restriction channel being formed in part by a head portion of said divider means; and said expansion chamber having a cross-sectional area greater than that of any cross-section of said pressure compensating restriction channel, and being also of greater cross-sectional area than said tapered flow restriction channel;

wherein said manifold chamber has a longitudinal dimension of sufficient magnitude that a molten thermoplastic stream exiting from said manifold chamber is at a relatively greater pressure at a side-to-side midpoint than at the sides thereof;

wherein said pressure compensating restriction channel is of increasing cross-sectional area from the center to each end thereof so as to provide inverse resistance to flow



whereby the molten stream, which is at said relatively greater pressure at said midpoint prior to flowing through said pressure compensating restriction channel, is caused to exit from this channel at substantially equal pressure from side to side;

wherein said expansion chamber and said tapered flow restriction channel have a longitudinal dimension that maintains the molten stream at said substantially equal pressure;

whereby a molten stream exits at said substantially equal pressure from said tapered flow restriction channel of each of said flow channels, and convergence of the molten streams forms a layered melt stream that is flowing at said substantially equal pressure;

said free floating divider means automatically pivoting in response to any difference between the flow rates of said molten streams whereby said convergence is at substantially equal flow velocities.

4,533,309

COLLAPSING FRAME FOR MOVING TUBES OF PLASTIC MATERIAL

Mirek Planeta, 5396 Windermere Dr., Burlington, Ontario, Canada (L5L 3M5)

Filed Jun. 15, 1983, Ser. No. 504,570

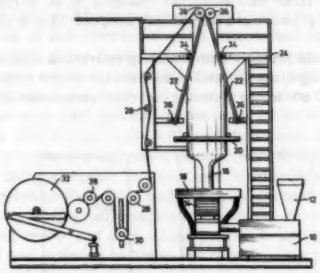
Int. Cl.³ B29C *15/00*

U.S. Cl. 425—326.1 **5 Claims**

1. A collapsing frame for collapsing a tube of plastic material from a tubular circular cross-section to a flattened form, the collapsing frame comprising:

two frame members each adapted to be disposed on a diametrically opposite side of the tube and converging toward one another in the direction of movement of the tube so as to collapse the tube upon movement of the tube in said direction of movement and engagement of the tube with the frame members,

each frame member having mounted thereon for engagement with the tube a plurality of parallel rollers mounted for free rotation about parallel axes that are perpendicular to the direction of tube movement, the width of said parallel rollers increasing progressively and symmetrically about a centre line in said direction of tube movement, so as to progressively contact a larger surface portion of the tube as it moves between the converging frame and guide the tube until its width is defined by the width of the frame,



each rollers comprising a plurality of independently rotatable rollers mounted side-by-side with one another to provide a substantially continuous surface of engagement with the tube, said independently rotatable rollers constituting means effective to permit said tube to have different speeds in the direction of movement of said tube and being of a material so as to provide a minimal coefficient of friction with said tube.

4,533,310

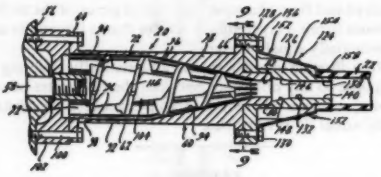
ICE MAKING APPARATUS

Joseph R. Spinner, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Division of Ser. No. 187,133, Sep. 15, 1980, Pat. No. 4,433,559, which is a continuation of Ser. No. 867,892, Jan. 9, 1978, abandoned. This application Jul. 28, 1982, Ser. No. 402,552

Int. Cl.³ B05B *3/00*

U.S. Cl. 425—376 R **9 Claims**



1. Apparatus for producing relatively solid ice bodies from crushed or flake ice comprising,

an extruder body having an axially extending generally horizontally disposed circular chamber therein having a wall section of progressively decreasing diameter,

a generally vertically disposed downwardly extending ice inlet the center line of which is laterally displaced from the axis of said chamber opening into the side of said chamber adjacent the larger end of said section through which said ice can enter said chamber in part at least under the influence of gravity,

an ice extruding auger rotatably mounted in said body and having a helical ice advancing flight thereon of substatially the same progressively decreasing diameter as the corresponding chamber section and forming with said wall section an annular space,

said auger acting to advance said ice from said inlet through said annular space and thereby compress and dewater the same and produce said relatively solid ice bodies,

means axially aligned with and disposed at the larger end of said chamber for rotating said auger,

and an axially extending outlet for said relatively solid ice bodies axially aligned with said chamber and positioned adjacent the smaller end of said auger body.

4,533,311

APPARATUS FOR PRODUCING DEEP, CONICAL OR CYLINDRICAL CERAMIC HOLLOW BODIES FROM A POWDERED OR GRANULAR PRESSED MASS BY ISOSTATIC COMPRESSION

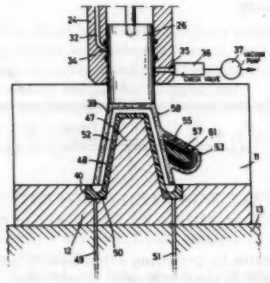
Wilhelm von Karchowski, Trier, Fed. Rep. of Germany, assignor to Laeis-Werke AG, Trier, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,572

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304576

Int. Cl.³ B30B *5/02, 11/00*

U.S. Cl. 425—405 H **14 Claims**

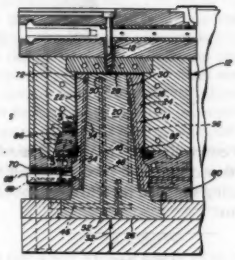


1. Apparatus for producing deep conical or cylindrical ceramic hollow bodies from a powdered or granular pressing material according to an isostatic compression process, said apparatus comprising, in combination: a hydraulic press including a machine base, a crosshead supported on and vertically disposed above said base; a storage container, including a dosaging member for the pressing mass, mounted on said crosshead; a pressure piston displacably mounted in a cylindrical body suspended from said crosshead; and a pressing mold mounted on said base beneath said cylindrical body, and including female and male mold portions, said female mold portion having a fill opening for the pressing mass in its upper surface with said fill opening being sealable by said pressure piston when it is lowered; said male and female mold portions defining, within said pressing mold, a major press chamber for forming a hollow body and an additional press chamber for forming at least one projection on said hollow body, with said additional pressure chamber being connected with said major press chamber, said female mold portion being divided into a plurality of sections along at least one parting surface extending through said additional press chamber for said at least one projection; means for maintaining said female mold sections in a closed position to form said press chambers during the pressing process and for moving said female mold sections apart in a direction perpendicular to the direction of movement of said pressure piston at the end of a pressing process; and isostatic pressure means, including at least one diaphragm which is disposed in said press chambers between said male and female mold portions to define a pressure chamber which is chargeable with a pressurized fluid, for compressing pressing material in said press chambers during the pressing process.

4,533,312
SIMPLIFIED COLLAPSIBLE MOLD CORE

John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Dec. 27, 1982, Ser. No. 453,230
Int. Cl.³ B29C 1/06; B29F 1/022
U.S. Cl. 425—438 12 Claims



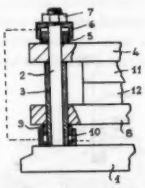
1. In molding apparatus a collapsible mold core and an outer mold half for defining a mold cavity therebetween, and means for placing molten material for molding into the mold cavity, said collapsible core defining outer core members movable between a molding position and a collapsed position to permit removal of the object mold, container lip forming means carried in said mold including an annular member extending axially of said core for defining an annular trough in said container lip, said container lip forming means and outer core members being movable by stripper plate means while the remainder of said core member is stationary, and further including cam means actuatable as said outer core members move longitudinally and inwardly in the motion of mold collapse to force said outer core members to move forward relative to said container lip forming means as the mold is opened.

7. A collapsible mold core for use with an outer mold half for defining a mold cavity therebetween and means for displacing molten material into the mold cavity for molding a part, said collapsible mold core comprising, in combination, central inner core means of the general shape of a truncated cone but having a plurality of substantially flat surfaces extending along the length of said inner core means in circumferentially spaced relation, a first plurality of outer core elements, one in engagement with each of said flat surfaces for longitudinal sliding movement relative to said flat surfaces, said flat surfaces being tapered relative to the longitudinal axis of said central inner core means, and a second plurality of outer core elements positioned around said central inner core means intermediate said first outer core elements and equal in number thereto, the outer surfaces of said first and second plurality of outer core elements together defining a generally cylindrical surface when in their expanded molding position, said central inner core means having arcuate surfaces intermediate said flat surfaces and said second plurality of outer core elements being in engagement with corresponding ones of said arcuate surfaces for longitudinal sliding movement relative to said arcuate surfaces, said first and second outer core elements being slidable relative to said central inner core means in one direction to form a molding configuration and in a second direction to define a collapsed configuration, said first plurality of outer core elements being interconnected with said second plurality of outer core elements by pins extending between side elements so that said second plurality of outer core elements vertically supports said first plurality of outer core elements.

4,533,313
PRESS WITH COLUMNS COMPENSATED FOR DEFORMATION DURING TIGHTENING

Pierre Poncet, 12 bis Rue Trarieux, 69003 Lyon, France

Filed Jun. 22, 1984, Ser. No. 592,310
Int. Cl.³ B29F 1/06
U.S. Cl. 425—451.2 6 Claims

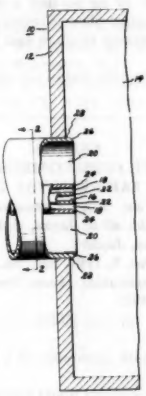


1. Press comprising columns of which each is constituted by a central core slidably surrounded by a sleeve, whilst an auxiliary jack is disposed between these two members for pre-stressing the core in traction and the sleeve in compression, characterized in that this auxiliary jack is controlled by the hydraulic tightening pressure so as to impose on the sleeve a pre-stress of compression equal or at least approximately equal to the force of traction imposed on the core of the column, so as to eliminate, or at least reduce to a large extent, the deformations of the sleeve during tightening of the press.

4,533,314
METHOD FOR REDUCING NITRIC OXIDE EMISSIONS FROM A GASEOUS FUEL COMBUSTOR

Paul V. Herberling, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,374
Int. Cl.³ F23J 7/00
U.S. Cl. 431—4 7 Claims



1. A method for reducing nitric oxide emissions from a gaseous fuel combustor, comprising:

introducing a combustion gas containing nitrogen and oxygen into a combustion chamber;

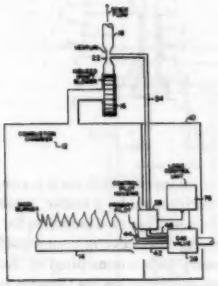
introducing a fuel gas into said chamber;

introducing a cooling gas into said chamber in such a manner that said cooling gas is interleaved between said combustion gas and said fuel gas substantially at the point where said gases are introduced into said chamber.

4,533,315
INTEGRATED CONTROL SYSTEM FOR INDUCED DRAFT COMBUSTION

Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 15, 1984, Ser. No. 580,325
Int. Cl.³ F23M 3/00
U.S. Cl. 431—20 6 Claims



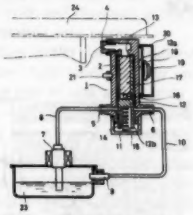
1. A system for controlling the fuel to air ratio in an induced draft combustion chamber comprising in combination:
- a combustion chamber;
- a gas fuel burner in said combustion chamber;
- means for supplying fuel to said combustion chamber fuel burner;
- means for inducing a flow of air in said combustion chamber to support combustion of said fuel;
- a control pilot chamber;
- a gas fuel burner in said control pilot chamber
- means for supplying fuel to said control pilot burner;
- means for establishing a proportional ratio between the quantity of fuel fed to the combustion chamber burner and the quantity of fuel fed to said control pilot burner;
- means coupling said control pilot chamber to said means for inducing a flow of air so that a quantity of air drawn through said control pilot chamber is proportional to the quantity of air drawn through said combustion chamber; and
- means for controlling the fuel to air ratio in said control pilot chamber.

4,533,316
VAPORIZING TYPE FUEL COMBUSTION APPARATUS WITH TAR REMOVAL DEVICE

Kenichi Takino, Yao; Eiji Yamasaki, Nara, and Kenji Murakami, Takaishi, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 8, 1981, Ser. No. 328,664
Claims priority, application Japan, Dec. 8, 1980, 55-176001; Dec. 10, 1980, 55-174973
Int. Cl.³ F23N 5/24
U.S. Cl. 431—32 5 Claims

1. A fuel combustion apparatus of a fuel vaporizing type comprising:
- a fuel injector for receiving liquid fuel and dispensing vaporized fuel;
- a vaporizing chamber being formed within said fuel injector;
- a vaporizing cylinder operatively positioned within said vaporizing chamber;
- a vaporizing core operatively positioned within said vaporizing cylinder;
- a heater being positioned adjacent to said fuel injector for heating liquid fuel supplied thereto;
- supply means for supplying liquid fuel to said vaporizing chamber for vaporization of said liquid fuel by said heater;
- control means for selectively deactivating the supply means while activating the heater for removing tar from within said fuel injector;
- wherein said control means includes a timer and a thermistor



for selectively controlling the heating of said fuel injector for a predetermined time at a predetermined temperature without fuel being supplied thereto for removing tar from said fuel injector.

4,533,317
YTTRIUM OXIDE MANTLES FOR FUEL-BURNING LANTERNS

Gilbert J. Addison, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

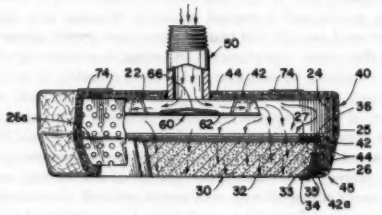
Filed Aug. 29, 1983, Ser. No. 527,217
Int. Cl.³ F21H 3/00, 1/02
U.S. Cl. 431—100 9 Claims

1. A mantle of improved strength and durability for a fuel-burning lantern, comprising an open-topped woven combustible mantle sack impregnated with a mixture of metal hydroxides convertible to the corresponding metal oxides on first firing to provide an incandescent metal oxide mantle, the upper portion of said mantle sack providing a hardened attachment head, wherein the improvement comprises having said mantle sack impregnated with a hydroxide mixture consisting essentially of yttrium hydroxide modified with a small proportion of cerium hydroxide, said hydroxides being present in relative proportions providing a metal oxide mantle containing from 1.8 to 3.8 parts by weight of cerium oxide per 100 parts of yttrium oxide.

4,533,318
RADIANT BURNER

Arnold L. Buehl, Solon, Ohio, assignor to Slyman Manufacturing Corporation, Cleveland, Ohio

Filed May 2, 1983, Ser. No. 490,343
Int. Cl.³ F23D 13/12; F24C 3/04
U.S. Cl. 431—328 3 Claims



1. In a gas-fired radiant burner including a gas-permeable matrix of refractory fiber material having a generally equal degree of porosity throughout, the matrix having an inner face, and outer face, and a gas nonpermeable peripheral edge separating the faces, the burner further including a plenum means sealed against the periphery of the inner face of the matrix to

supply a pressurized combustible gas thereto for burning at the outer face of the matrix, the burner further including a flexible blanket of thermal insulation material wrapped around the outside of the plenum means to thermally insulate the plenum means from high temperature gas byproducts generated by said burning, an edge portion of the blanket being biased against the edge of the matrix, the improvement comprising:

a strip of deformable material fixed to the plenum means and extending about the peripheral edge of the matrix, the strip being bent over toward the peripheral edge of the matrix to engage the edge portion of the blanket to bias it against the peripheral edge of the matrix whereby the inner face of the heating element is restrained in position against the plenum means, wherein said strip of deformable material is constituted by sheet metal extending generally continuously about the peripheral edge of the matrix, the bent metal strip being separated from the peripheral edge of the matrix by the edge portion of the blanket, the strip applying to the edge portion of the blanket a generally constant biasing force at generally all points about the peripheral edge of the matrix.

4,533,319

METHOD OF AND APPARATUS FOR MONITORING A ROTARY KILN ASSEMBLY

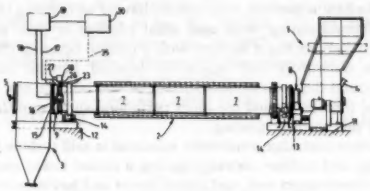
Clive A. Mathews, Preston, and George M. Gillies, St. Annes, both of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Nov. 16, 1983, Ser. No. 552,440

Claims priority, application United Kingdom, Dec. 14, 1982, 8235591

Int. Cl.[3] **F27D** *1/16, 21/00;* **F27B** *1/26*

U.S. Cl. 432—3 **6 Claims**



1. A method of monitoring a rotary kiln assembly which comprises, on a common longitudinal axis, a rotary kiln, an inlet arrangement for the kiln, an outlet arrangement for the kiln, seal means between the inlet arrangement and the kiln, further seal means between the kiln and the outlet arrangement, each of the seal means and the further seal means having a part rotatable with the kiln and another part secured to the respective inlet or outlet arrangement, the method comprising disposing a plurality of displacement transducers to detect relative displacement between the kiln and said inlet and outlet arrangements, which relative displacement is not restricted to movement in the common axis, transmitting from said transducers to a monitoring arrangement signals generated by said relative displacement, and monitoring said signals with the monitoring arrangement.

4,533,320

STABILIZING RETAINER SYSTEM

Jack Piekarsky, 23 Pilgrim Way, Wayne, N.J. 07470

Filed Jul. 26, 1984, Ser. No. 634,455

Int. Cl.[3] **A61C** *3/00*

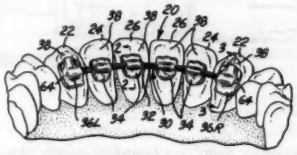
U.S. Cl. 433—9 **16 Claims**

1. A stabilizing retainer for maintaining the position of a series of teeth in the mouth, each tooth of the series including a surface area bounded by peripheral edges and having given surface contours, said stabilizing retainer comprising:

a relatively thin, conformable wire for placement in a predetermined position in which the wire spans the series of teeth and is conformed into contiguity with the series of teeth;

a plurality of individual, relatively thin bonding pads for being bonded, one each to each tooth of the series of teeth, each bonding pad including peripheral edges, an obverse surface and a reverse surface;

basal surface portions on the reverse surface of each bonding pad, the basal surface portions having a surface contour complementary to the surface area of a corresponding tooth of said series of teeth and a surface area less than the



corresponding surface area of said tooth such that the peripheral edges of each bonding pad will be spaced from the peripheral edges of the corresponding tooth when said bonding pad is bonded to said tooth; and

a transverse channel in each bonding pad, the transverse channel being generally complementary to the wire and open toward the reverse surface for receiving the conformable wire to locate each bonding pad and secure the conformable wire in said predetermined position when the bonding pads are placed over the conformable wire and bonded to said series of teeth.

4,533,321

BRAIDED ELASTOMER ORTHODONTIC TENSIONING DEVICE

Patrick D. Kidd, San Dimas; Terry L. Sterrett, Long Beach, and Craig A. Andreiko, Alta Loma, all of Calif., assignors to Sybron Corporation, Rochester, N.Y.

Filed May 1, 1984, Ser. No. 605,892

Int. Cl.[3] **A61C** *3/00*

U.S. Cl. 433—18 **4 Claims**

1. An orthodontic tensioning thread comprising a braided plurality of elastomeric strands,

said plurality of strands having an overall outside diameter D and a combined cross sectional area A of elastomeric material,

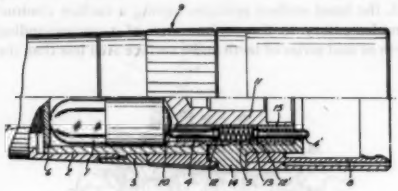
said strands interacting in tension to import to said thread properties of tensile strength, elasticity retention, tieability, and knot retention greater than corresponding properties of a monofilament of the same material and diameter D having a cross sectional area $\pi D^2/4$ greater than A.

4,533,322

DENTAL INSTRUMENT LIGHT

Philippe Garcia, Besancon, and Michel Seigneurin, Douvaine, both of France, assignors to Micro-Mega, Besancon, France

Filed Feb. 8, 1984, Ser. No. 578,278
Claims priority, application France, Feb. 8, 1983, 83 02092
Int. Cl.[3] A61C 3/00
U.S. Cl. 433—29 3 Claims



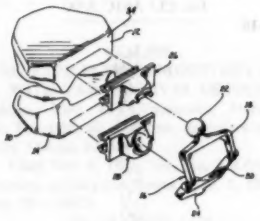
1. A device for supplying luminous energy to a dental instrument to illuminate an area of treatment on a tooth comprising, an electric bulb in the instrument, means for connecting the instrument to a head of an electrical energy supply cable, an optical fiber extends through the instrument having an end disposed for receiving luminous energy from the bulb for transmission therethrough, contact means for energizing the bulb immediately upon connection to the cable, the contact means comprising two conductive studs disposed separated from each other, a conductive biasing spring elastically separating the two studs, an insulating sleeve, and said studs being disposed axially spaced within said sleeve and said spring disposed in said sleeve maintaining the studs axially biased apart.

4,533,323

MOUNTING FOR DENTAL MODEL ARTICULATORS

Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 486,897, Apr. 20, 1983, Pat. No. 4,449,930. This application Sep. 19, 1983, Ser. No. 533,416
Int. Cl.[3] A61C 11/00
U.S. Cl. 433—60 17 Claims



1. A one piece mounting for securing one part of an articulator to the rear face of a dental model cast made of flowable, curable, hardenable material, said mounting comprising in combination:

(a) plate means for bearing against the rear face and for positionally locating said mounting with respect to the dental model cast;

(b) a structure extending from said plate means for defining an element of a ball and socket joint; and

(c) locking means extending from another side of said plate means for insertion into th dental model cast through the rear face, said locking means including laterally expanded means for mechanically locking said member with the dental model cast upon curing of flowable, curable and hardenable material enveloping said laterally expanded means within the dental model cast;

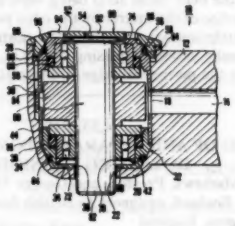
whereby, said mounting, upon mating of the other element of the ball and socket joint disposed upon the articulator with said structure, secures the dental model cast to the articulator.

4,533,324

AIR DRIVEN DENTAL HANDPIECE

Takasuke Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Mfg., Co., Ltd., Kanuma, Japan

Filed Feb. 7, 1984, Ser. No. 577,783
Claims priority, application Japan, Feb. 9, 1983, 58-17728[U]
Int. Cl.[3] A61C 1/05
U.S. Cl. 433—132 1 Claim



1. An air driven dental handpiece comprising:

a handle portion having an axial passage for supplying air under pressure;

a turbine housing mounted on one end of said handle portion and having an axis extending perpendicular to the axis of the handle portion, said turbine having an opening therein communicating with said axial passage in said handle portion, having a bottom with a central opening therein, an outwardly and upwardly tapered annular surface around the inner bottom surface of said bottom, and internal threads around the inner peripheral surface of the top of said turbine housing;

a turbine cartridge removably mounted in said turbine housing, said turbine cartridge having a closed lower end and a closed upper end, said closed lower end having a central opening and an outwardly facing outwardly and upwardly tapered annular surface around the periphery thereof abutting said tapered annular surface on the inner surface of said bottom, said closed upper end having a central opening and an outwardly facing outwardly and downwardly tapered annular surface around the periphery thereof;

ball bearings in the lower and upper parts of said tubine cartridge;

an air turbine rotatably mounted in said turbine cartridge and having a rotor shaft mounted in said ball bearings and radially extending turbine blades mounted on said shaft, said rotor shaft extending perpendicularly to said handle portion and said shaft, blades and bearings being resiliently mounted in said cartridge in the direction of the length of said shaft;

a head cap having a central exhaust opening and external threads around the periphery thereof threaded into the internal threads around the peripheral surface at the top of said turbine housing, said cap having a downwardly and outwardly tapared annular surface on the under side thereof abutting said downwardly and outwardly tapered annular surface on the upper end of said turbine cartridge for holding said turbine cartridge in a single fixed position in said turbine housing;

at least one of said tapered annular surfaces in each pair of abutting tapered annular surfaces having an inwardly recessed slot therein; and

elastic sealing rings fitted in said inwardly recessed slots and

in sealing engagement with the other of the abutting pair of annular tapered surfaces.

4,533,325

METHOD AND APPARATUS TO PRODUCE ARTIFICIAL TEETH FOR DENTURES

John J. Blair; Frank P. Fonvielle, both of York; Richard A. Smith, New Freedom; Barry D. Dehoff, York, and Roger C. Shue, Red Lion, all of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Jul. 1, 1983, Ser. No. 510,405

Int. Cl.³ A61C *13/22*

U.S. Cl. 433—171 **4 Claims**

1. A plurality of integral artificial teeth comprising at least one anterior tooth having its labial face disposed at an angle from the vertical of about 0° to 10° sloping backward from the incisal edge for at least about 70 percent of the length of the tooth, and at least one posterior tooth having its buccal face disposed at an angle from the vertical of about 1° to about 10° sloping inward from the gingival edge for at least about 90 percent of the length of the tooth.

4,533,326

ORAL PACK RETENTION SYSTEM

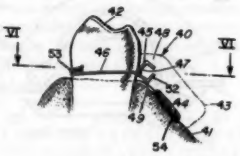
Albert J. Anthony, 45 Central St., West Boylston, Mass. 01583

Continuation-in-part of Ser. No. 291,445, Aug. 10, 1981, abandoned. This application Jan. 13, 1983, Ser. No. 457,762

The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.³ A61C *19/06*

U.S. Cl. 433—229 **14 Claims**



1. An oral pack retention system for use in covering a location in the mouth, comprising:

(a) a retention fixture adapted to be located adjacent a tooth,

(b) a flexible wire adapted to extend tightly around the tooth and to be fastened to the fixture, and

(c) a mass of pack material cured to the fixture and covering the said location.

4,533,327

APPARATUS FOR THE SUPERVISION OF A COMBAT VEHICLE, ESPECIALLY AN ARMORED VEHICLE

Wolfgang Kratzenberg, Staufenberg, and Bernd Baeslack, Fuldabruck, both of Fed. Rep. of Germany, assignors to Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

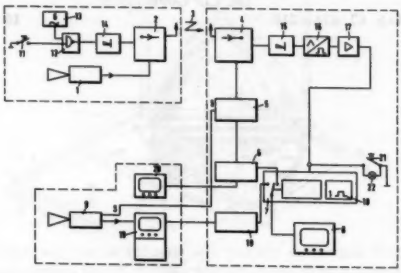
Filed Jun. 8, 1983, Ser. No. 502,355

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222970

Int. Cl.³ G09B *9/04*

U.S. Cl. 434—20 **5 Claims**

1. In an apparatus for supervising an armored battle vehicle from a control station during training in the field, the apparatus having a firing switch for producing a firing signal, at least one first television camera which is optically coupled to an aiming device in the vehicle and which produces a first video output signal, a television receiver disposed in the control station and means for transmitting the output signal of the first camera to the control station, the improvement comprising: a second television camera for producing a second video output signal



and disposed in a stationary location outside of the vehicle in the field and aimed at a target area; means conducting the second video output signal to the control station; means for effecting transmission of the firing signal to the control station by the transmitting means; and remotely controllable switching means disposed in the control station and actuated by the firing signal for applying either the output signal from the first camera or the output signal from the second camera to the television receiver in the control ration.

4,533,328

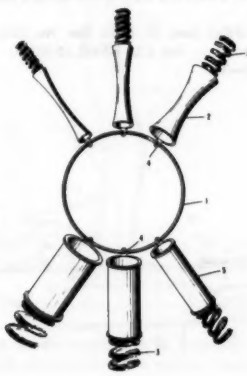
PERMANENT WAVE OR HAIR CURLING ROD AND ASSOCIATED HAIR CURL DISPLAY DEVICE

Francina E. McDaniel, 3320 Woodburn Village Dr., #23, Annandale, Va. 22003

Filed Mar. 15, 1984, Ser. No. 589,712

Int. Cl.³ G09B *25/00*

U.S. Cl. 434—94 **18 Claims**



1. A device for displaying the curls or waves produced by hair styling implements of different sizes comprising a support means to which is attached at least one of said hair styling implements or indicators thereof, each of said hair styling implements or indicators having a lock of hair intimately associated therewith, said lock of hair being representative of the

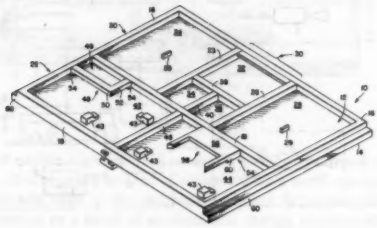
curl or wave produced by the hairstyling implement or indicator with which it is associated.

4,533,329

EDUCATIONAL DEVICE FOR TEACHING THE PROPER PLACEMENT OF INFORMATION

Corey N. Jones, Severn, and Patricia A. Hawkins, Laurel, both of Md., assignors to PSI Associates, Inc., Washington, D.C.

Filed Jun. 26, 1984, Ser. No. 624,735
Int. Cl.³ G09B *19/00*
U.S. Cl. 434—219 **16 Claims**



1. An educational device comprising:

a board having a top surface and a bottom surface, said top surface divided into a plurality of compartments, including

a holding compartment for holding a supply of information-receiving elements;

a processing compartment for positioning information receiving elements from said holding compartment, said processing compartment having retaining and guide means for retaining an information-receiving element and for guiding the placement of information onto a specific, desired position on the information-receiving element; and

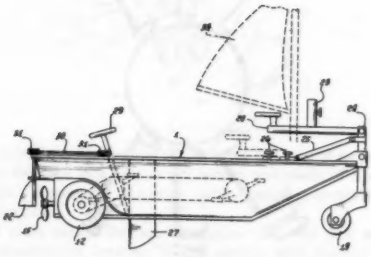
a storage compartment for storing information-receiving elements processed in said processing compartment.

4,533,330

PEDAL POWERED SAILBOAT

Andrew Chun, #235, 3rd Ka, Nowon-dong, Puk-ku, Daegu, Rep. of Korea

Filed Aug. 18, 1983, Ser. No. 524,355
Int. Cl.³ B63H *16/00*
U.S. Cl. 440—30 **5 Claims**



1. An amphibious pedal powered sailboat apparatus comprising in combination:

a relatively lightweight boat hull having an upper deck portion, a bow portion and a stern portion, said hull including peripheral air tanks mounted along the interior of said hull;

a front pair of wheels mounted on said hull for steering and to provide mobility of said apparatus on land and a rear pair of wheels mounted on said hull, to provide traction and mobility of said apparatus on land;

means for elevating said front pair of wheels mounted on said hull from ground level to deck level;

a first pedalling stand fixedly mounted in the bow portion of said hull and a second pedalling stand fixedly mounted in the stern portion of said hull;

said first and second pedalling stand each comprising a pair of foot pedals mounted on said pedalling stand for rotational movement about a horizontal axis transverse to the longitudinal axis of said hull;

drive means for coordinated operation of said pair of foot pedals on said pedalling stands;

said drive means including plural drive chains and plural sprocket wheels and gearing means for translating and apportioning the rotational movement of said foot pedals to a screw propeller mounted on said hull and to said pair of rear wheels mounted on said hull;

a sail for optionally powering said apparatus by wind power; and

steering means for controlling directional movement of said apparatus;

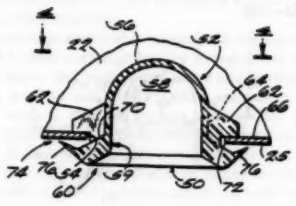
wherein rotational movement of said foot pedals by one or more occupants is transmitted to said gearing system of said drive means which synchronously powers said screw propeller and powers said rear pair of wheels to provide amphibious operation of said apparatus.

4,533,331

VENT AND DRAIN ASSEMBLY FOR MARINE PROPULSION DEVICE

Gerald F. Bland, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 338,333, Jan. 11, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,158
Int. Cl.³ B63H *21/26*; F16K *31/22*
U.S. Cl. 440—88 **13 Claims**



1. A marine propulsion device comprising a propulsion assembly including a lower unit having a gear case normally submerged in water and carrying a rotatably mounted propeller, an upper unit including a powerhead shroud normally located above the water, defining an engine compartment, and including a bottom wall with a portion extending forwardly of said lower unit, said portion having therein an aperture, and an outer, marginal wall surface extending from said aperture and intersecting said aperture to form an aperture edge, an internal combustion engine for driving said propeller disposed inside said engine compartment, and a vent and drain assembly including a valve member movably disposed in said aperture for movement between a normally open position and a closed position and including a sealing portion which is disposed exteriorly of said shroud bottom wall, and which is adapted to sealingly engage said marginal wall in an area in adjacently spaced relation from said aperture edge when said valve member is in the closed position, said valve member being in the normally open position to permit ventilation of said engine compartment to the atmosphere through said aperture and to afford drainage of liquid from said engine compartment through said aperture when the water level is below said

shroud bottom wall and being movable to the closed position to prevent ingress of water into said engine compartment through said aperture in response to a rise in the water level above said shroud bottom wall.

4,533,332

MOORING SYSTEM

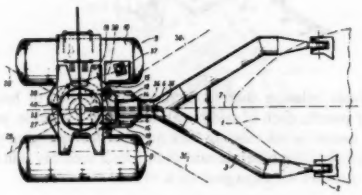
Anton Coppens, and Leendert Poldervaart, both of La Turbie, France, assignors to Single Buoy Moorings, Inc., Fribourg, Switzerland

Filed Feb. 1, 1983, Ser. No. 463,053

Claims priority, application Netherlands, Feb. 1, 1982, 8200358

Int. Cl.³ B63B *21/52*

U.S. Cl. 441—3 **2 Claims**



1. In a mooring system comprising a buoy of the type floating at the water surface, which buoy is anchored by means of anchor chains, a floating vessel, a rigid arm interconnecting the vessel and buoy, said arm being connected with the vessel pivotably only about a horizontal axis extending transversely to the length of the arm and of the vessel; the improvement in which the buoy comprises at least two spaced-apart parallel elongated floats which are interconnected by a bridge member and which extend parallel to the length of the rigid arm and vessel, said bridge member having a turntable journalled thereon for rotation about a vertical axis, means connecting said anchor chains to said turntable, said arm being connected pivotably with the bridge member about a second horizontal axis parallel to the first mentioned horizontal axis, and means pivotably interconnecting said bridge member and said rigid arm for rotation relative to each other about an axis perpendicular to and passing through said second horizontal axis and extending lengthwise of said rigid arm.

4,533,333

HELICOPTER EXTRACTABLE COLD WEATHER/WATER LIFERAFT

Wesley A. Andrew, Woodbridge; Curtis E. Shields, Virginia Beach; Harry O. Hindlin, Virginia Beach, and Robert Hamilton, Virginia Beach, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 8, 1980, Ser. No. 176,376

Int. Cl.³ B63C *9/04*

U.S. Cl. 441—38 **7 Claims**

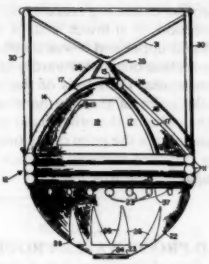
1. In an improved liferaft having a base supporting a continuous side above and a water filled ballasting chamber below for protecting survivors from exposure, an improvement therefor is provided comprising:

means extending beneath and across the base and terminating above it for cradling the base, sides and survivors;

means coupled to the cradling means at its termination above the base and sides for positioning a portion to engage a lifting hook;

means disposed on the ballasting chamber for providing at least one opening for dumping water from the ballasting chamber as the liferaft is lifted from the water by the lifting hook; and

means having three radially extending inflatable ribs supporting a covering which is coupled at its lower edge to the sides to form a protective enclosure for creating an aerodynamically stable body as the liferaft is being towed through the air after it has been lifted from the water, the covering is provided with an internally exposed layer that reflects heat in the interior to help prevent hypothermia, the cradling means has portions radially converging be-



neath and across the base and radially converges at the termination above the base and separated from and above the aerodynamically stable body creating means and the opening providing means is at least one panel having means between at least a portion of its periphery and the sides of the ballasting chamber for parting being subject to a predetermined pressure differential.

4,533,334

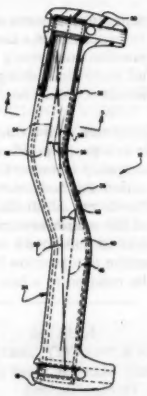
TOW LINE HANDLE

Joseph F. Ziomek, 3236 Pine Lake Rd., West Bloomfield, Mich. 48033

Continuation of Ser. No. 444,831, Nov. 26, 1982, abandoned. This application Sep. 13, 1984, Ser. No. 650,557

Int. Cl.³ B63B *21/56*

U.S. Cl. 441—69 **8 Claims**



1. A tow line handle adapted to be manually gripped in a generally upright orientation by a person being towed in a forward direction, said handle comprising an upwardly and forwardly sloping lower section adapted to be engaged by one hand of the towed person with a thumb of the one hand upwardly and the fourth finger of the one hand downwardly, said lower section of said handle including a lower end portion having first means for engaging a portion of a tow line to provide for the application of force to said handle by the tow line at a location beneath the fourth finger of the one hand, an

upwardly and forwardly sloping upper section adapted to be engaged by the other hand of the towed person with the thumb of the other hand upwardly and the fourth finger of the other hand downwardly adjacent to the thumb of the one hand, said upper section of said handle including an upper end portion having second means for engaging a portion of the tow line to provide for the application of force to said handle by the tow line at a location above the thumb of the other hand, and a connector section extending rearwardly from an upper end of said lower section to a lower end of said upper section to interconnect said upper and lower sections with the lower end of said upper section offset rearwardly of the upper end of said lower section so that the hands of the towed person are disposed with the palm of the one hand on a first side of said handle and the palm of the other hand on the opposite side of said handle and above the palm of the one hand, said connector section being disposed midway between said first and second means for engaging the tow line.

4,533,335

COLD-PROOF WATER-PROOF GARMENT

Takahiro Hoshino, Yokohama, Japan, assignor to Toyo Bussan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1983, Ser. No. 472,021
Int. Cl.³ B63C *9/16*
U.S. Cl. 441—102 **10 Claims**

1. A method of facilitating rotation of a man wearing a full body suit with fluid buoyancy from a face-down prone position to a face-up prone position comprising the steps of:

(a) providing a full body suit having a buoyancy chamber internally of the suit asymmetrical over the chest of the wearer;

(b) inflating the body suit with a buoyant fluid adequate to float the wearer in a prone position; and

(c) inflating the buoyancy chamber (1) to provide asymetrical buoyancy within the body suit over the chest of the wearer and (2) to create additional space within the suit over the chest of the wearer asymmetrically for the buoyant fluid to collect to thus rotate the wearer from a face-down prone position to a position from which the wearer can complete the rotation to a face-up prone position.

4,533,336

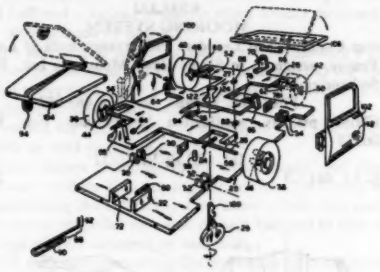
LOCKING TOY VEHICLE

John Dixon, and Peter Manning, both of Hayne Barton, Shillingford, Tiverton, Devon, England

Filed Apr. 29, 1983, Ser. No. 490,235
Int. Cl.³ A63H *17/00*
U.S. Cl. 446—465 **14 Claims**

1. A toy vehicle having a body with at least one part mounted thereon in movable relation thereto, a shackle on the interior of said part and projecting into the interior of said vehicle, a sliding lock member supported and positioned inside said body and slidable relative thereto to move between two positions, key means, means for permitting insertion of said key means into said body at a point which engages said sliding lock member is selectively move said lock member between said two positions responsive to a rotation of said key means, and bolt means on said sliding lock member for engaging said shackle in one of said two positions and disengaging said shackle in the other of said two positions;

wherein said at least one part mounted on said body in



movable relation thereto includes a plurality of hinged body panels, each of said panels including a shackle, and a bolt means on said sliding lock member for engaging each of said shackles wherein said sliding lock member is in said one position for engaging each of said shackles.

4,533,337

HYDRAULIC TORQUE IMPULSE TOOL

Knut C. Schoeps, Tyresö, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sep. 19, 1983, Ser. No. 533,500
Claims priority, application Sweden, Sep. 24, 1982, 8205485
Int. Cl.³ B25D *15/02*
U.S. Cl. 464—25 **10 Claims**

1. In a hydraulic torque impulse tool comprising a housing, a rotation motor, an inertia drive member rotatably supported in said housing and drivingly connected to said motor, said inertia drive member being rotatable about a rotation axis, a fluid chamber in said inertia drive member, and an output spindle having a rear end extending into said fluid chamber,

the improvement comprising:

a piston (30;130) movably supported in said fluid chamber (19;119) for performing alternate impulse generating strokes and return strokes therein in a plane transverse to the rotation axis of the inertia drive member (10;110), said piston (30;130) dividing said fluid chamber (19;119) into two compartments (38;39;138;139);

a first seal means (31;131) on said piston (30;130);

a second seal means (28;128) on said inertia drive member (10;110) arranged to cooperate with said first seal means (31;131) over only a limited portion of said piston strokes for sealing off one of said compartments from the other;

a first cam means (43,44;143;144) on said piston (30;130); and

a second cam means (42;142) on said output spindle (11;111);

said first cam means (43,44;143,144) engaging said second cam means (42;142) to reciprocate said piston (30;130) in said fluid chamber (19;119) and to transfer the torque impulses thereby generated to said output spindle (11;111)

during rotation of said inertia drive member (10;110) relative to said output spindle (11;111).

4,533,338

DAMPER DISC

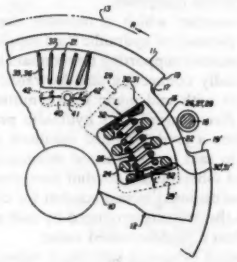
Tooru Hamada, Takatsuki, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Neyagawa, Japan

Filed Oct. 13, 1983, Ser. No. 541,641

Claims priority, application Japan, Oct. 13, 1982, 57-155394[U]

Int. Cl.³ F16D *3/14, 3/66*

U.S. Cl. 464—64 **3 Claims**



1. A damper disc comprising a hub adapted to be connected to an output shaft; a radial hub flange formed integrally with the hub; a pair of side plates having a torque input portion at the outer peripheral portion and disposed at the opposite sides of the hub flange; a pair of sub-plates disposed between the hub flange and the side plates; a sub-pin connecting the sub-plates together and passing through a circumferentially long recess in the hub flange radially outward from the hub, a circumferential space corresponding to a first torsion angle being formed between the sub-pin and the side edge of the recess; a first torsion spring mechanism radially outward from said sub-pin and having a low spring constant and operable to connect the sub-plates and the hub flange together at a torsion area below the first torsion angle; a second torsion spring mechanism having a large spring constant, connecting the side plates and the sub-plates together and operable to connect the side plates and the hub flange together at a torsion angle above the first torsion angle; and a stop pin connecting the side plates together and passing through recesses in said sub-plates and said hub flange radially outwardly from said second torsion spring mechanism.

4,533,339

CONSTANT VELOCITY JOINT

Sobhy L. Girguis, Magdalenestr. 19, D-5210 Troisdorf-Oberlar, Fed. Rep. of Germany

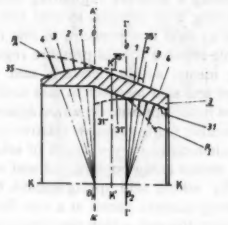
Filed Aug. 11, 1982, Ser. No. 407,096

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1981, 3134272

Int. Cl.³ F16D *3/22, 3/30*

U.S. Cl. 464—146 **10 Claims**

10. In a constant velocity joint having a hollow outer component with longitudinal tracks in its inner surface, an inner component placed in said outer component with annular space therebetween, said inner component having tracks in its outer surface corresponding to those in said outer component, balls in said tracks of said outer and inner components for transmission of torque between the two, a cage having an axis and arranged in said annular space and having apertures retaining said balls in a ball plane, said cage having a spherical concave control surface having a concave center of curvature, said concave control surface facing a mating surface of said inner component, said cage having a convex spherical control surface having a convex center of curvature, said convex control surface facing a mating surface of said outer component, said concave and convex centers of curvature being located on said cage axis and being equally spaced on either side of said ball plane; the improvement comprising having said concave control surface extending substantially from a radial plane parallel to the ball plane and containing said concave center of curvature to the side remote from said ball plane, all other points on the remainder of the inner surface of said cage having a distance from said concave center of curvature greater than the radius of said concave control surface, said mating surface of said inner component passing substantially through said radial plane containing said convex center of curvature, the remainder of said outer surface of said inner component having a substantially similar contour as that of said inner surface of said



cage when articulated around said concave center of curvature by half the maximum joint angle, said convex control surface extending substantially from a radial plane parallel to the ball plane and containing said convex center of curvature to the side remote from said ball plane, all other points on said outer surface of said cage adjacent to said convex control surface having a distance from said convex center of curvature less than the radius of said convex control surface, said mating surface of said outer component passing substantially through said radial plane containing said convex center of curvature, the remainder of said inner surface of said outer member having a substantially similar contour as that of said outer surface of said cage when articulated around said convex center of curvature by half the maximum joint angle.

4,533,340

HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE V-BELT TRANSMISSION

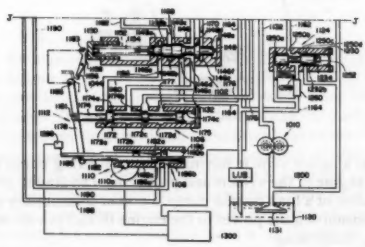
Keiju Abo, Yokosuka; Sigeaki Yamamuro, Zushi; Yoshikazu Tanaka; Haruyoshi Kumura, both of Yokohama, and Hiroyuki Hirano, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 20, 1983, Ser. No. 544,071

Claims priority, application Japan, Oct. 22, 1982, 57-184623

Int. Cl.³ F16H *11/04*

U.S. Cl. 474—28 **8 Claims**



1. A hydraulic control system for controlling a continuously variable transmission having a V-belt connecting a drive and a driven pulley, the drive pulley having a first cylinder chamber

and first and second conical discs, the driven pulley having a second cylinder chamber and third and fourth conical discs, the first conical disc being secured to a drive shaft, the third conical disc being secured to a driven shaft, the second conical disc being controllably movable in an axial direction with respect to the drive shaft in response to a fluid pressure in the first cylinder chamber, the fourth conical disc being controllably movable in an axial direction with respect to the driven shaft in response to a fluid pressure in the second cylinder chamber, the hydraulic control system comprising:

a source of hydraulic fluid pressure;

a line pressure regulator valve means for receiving and regulating said hydraulic fluid pressure and for generating a line pressure, said line pressure regulator valve means comprising a pressure regulating element having a pressure acting area exposed to said line pressure and being loaded by said line pressure in one direction, a member movable relative to said pressure regulating element, and spring means acting between said pressure regulating element and said member to bias said pressure regulating element in the opposite direction against said line pressure, said member being movable relative to said pressure regulating element to vary a length of said spring means, said spring means being constructed and arranged such that a force by which said spring means biases said pressure regulating element varies at a rate for a unit variation in said length thereof, which rate varies as said length varies, said pressure regulating element being movable in response to said force and said line pressure for effecting said regulation of said hydraulic fluid pressure thereby to generate said line pressure variable with said force;

a shift control valve means connected to said line pressure regulator valve means for receiving said line pressure and hydraulically controlling a reduction ratio between the drive and driven pulley; and

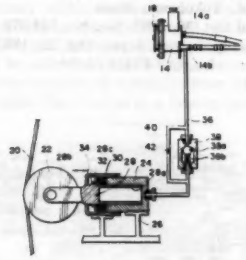
means responsive to said reduction ratio between the drive and driven pulley for urging said member toward said pressure regulating element so as to decrease said length of said spring means as said reduction ratio increases.

4,533,341

BELT TYPE POWER TRANSMITTING SYSTEM

Akira Yokota, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Apr. 14, 1982, Ser. No. 368,677
Claims priority, application Japan, Apr. 20, 1981, 56-58434
Int. Cl.³ F16H 7/12
U.S. Cl. 474—109 **8 Claims**



1. In a motor vehicle having a power steering pump driven by an engine of the vehicle and producing a hydraulic pressure indicative of a load on said pump, a power transmitting system for transmitting the power of the engine to said power steering pump, comprising:

an endless belt passing over both a first pulley directly driven by said engine and a second pulley securely mounted on a driving member of the power steering pump to rotate therewith;

an idler pulley rotatably engaging said belt to provide the same with tension; and

a hydraulic pressure-actuated device having mounted thereon said idler pulley, said device varying the position of the idler pulley relative to said belt continuously throughout a range in accordance with the load on said pump so that greater tension is provided between said idler pulley and said belt for greater loads on said pump and vice versa, said range having a predetermined minimum tension, said hydraulic pressure-actuated device being constantly and fluidly in communication with said pump irrespective of the magnitude of the pressure produced by said pump, wherein said hydraulic pressure actuated device comprises:

a movable member which is movable depending on the hydraulic pressure of hydraulic fluid supplied thereto, said movable member supporting thereon said idler pulley; and

a conduit fluidly connecting said hydraulic pressure actuated device with said pump for permitting fluid in said pump to flow toward said hydraulic pressure-actuated device when a predetermined minimum pressure corresponding to said predetermined minimum tension is exceeded and wherein said conduit comprises:

a check valve disposed in said conduit for closing said conduit when the pressure produced by said auxiliary device is lower than a predetermined value;

a bypass conduit bypassing said check valve; and

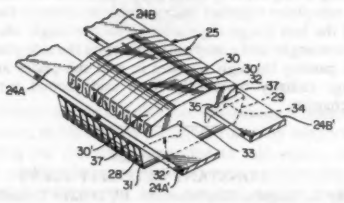
an orifice disposed in said bypass conduit for restricting the hydraulic fluid flow through said bypass conduit.

4,533,342

BELT CONSTRUCTION FOR A CONTINUOUSLY VARIABLE TRANSMISSION, TRANSVERSE BELT ELEMENT THEREFOR AND METHODS OF MAKING THE SAME

Joseph P. Miranti, Jr., Porter Township, Christian County; Larry R. Oliver, and Clyde O. Johnson, both of Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Jun. 6, 1983, Ser. No. 501,357
Int. Cl.³ F16G 5/00, 5/12
U.S. Cl. 474—201 **16 Claims**



1. In a belt construction for a continuously variable transmission, said belt construction having an endless flexible band means, and a plurality of belt elements carried by said band means in sliding relation therewith, each belt element having slot means receiving said band means therein and having opposed faces disposed adjacent faces of adjacent belt elements, each belt element having opposed sides for respectively engaging pulley faces of said transmission, said slot means for each belt element defining a pair of slots respectively interrupting said opposed sides thereof and being spaced from each other by a central stem portion of said element, said pair of slots for each element receiving parts of said band means therein and respectively defining a pair of shoulders engaging said parts of said band means, each shoulder of each belt element having an arcuate transverse crown surface provided with an apex that engages its respective part of said band means, the improvemem wherein said apex of each transverse crown surface of its respective belt element is disposed closely adjacent to its respective side to tend to bias its respective part of said

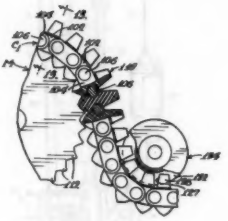
band means toward its respective central stem rather than toward its respective side.

4,533,343

ARTICLE STRAPPING METHOD AND APPARATUS, CHAIN ASSEMBLY FOR SUCH APPARATUS AND FOR OTHER APPARATUS, AND METHOD FOR MAKING SUCH CHAIN ASSEMBLY

Robert J. Kobiella, Rolling Meadows, Ill., assignor to Signode Corporation, Glenview, Ill.

Division of Ser. No. 442,524, Nov. 19, 1982, Pat. No. 4,479,834.
This application May 21, 1984, Ser. No. 612,572
Int. Cl.³ F16G *13/02*
U.S. Cl. 474—207 **10 Claims**



1. A V-pulley-driven or sheave-driven chain assembly for use with a slip-feed type of strap carrier in a machine for automatically strapping articles, said chain assembly comprising:

a chain comprising alternate pairs of inner and outer links with the ends of each outer pair of links overlapping and pivotally connected to the ends of an inner pair of links, said chain also including at least a cross member extending between the inner pair of links along the pivot axis associated with each connected inner and outer link; and

a friction driven lug fabricated from resilient material, said driven lug including

(a) a mounting body portion for being mounted between two adjacent cross members, said mounting body portion defining a convex cavity on each of two opposite ends for receiving a portion of one of said cross members,

(b) a driven body portion extending from said mounting body portion below said chain, said driven body portion having a pair outwardly facing engaging surfaces for engaging a V-pulley or sheave, and

(c) an extension body portion projecting from said mounting body portion opposite said driven body portion, said extension body portion including

(1) a tapered portion decreasing in thickness with increasing distance from said mounting body portion ends to facilitate insertion of said lug between said two adjacent cross members, and

(2) a disposable portion projecting from the distal end of said tapered portion by which said lug can be pulled into position in said chain with said mounting body portion retained between said two adjacent cross members and which disposable portion can be subsequently severed from said lug.

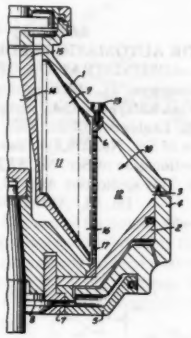
4,533,344

SELF-EMPTYING CENTRIFUGE DRUM

Hubert Gunnewig, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 629,937
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326708
Int. Cl.³ B04B *7/16, 7/18*
U.S. Cl. 494—36 **8 Claims**

1. In a self-emptying centrifuge drum for clarifying and separating liquids, having two parts including a bottom and a cover and means rotation-symmetrically connecting the two parts to form an annular gap in the vicinity of the longest diameter for letting off separated solids, a plate insert for separating off solids and a piston slide for opening and closing the gap, the improvement wherein the connecting means comprises a strainer basket mounted concentrically inside the drum



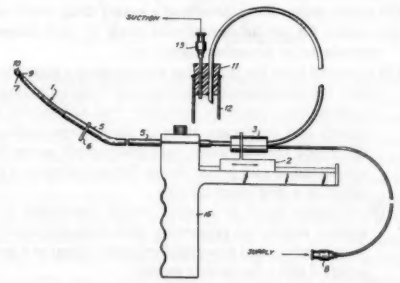
to surround the plate insert and means connecting an upper portion of the basket to the cover and a lower portion of the basket to the bottom, the basket being sufficiently rigid to prevent radial and tangential displacement of the bottom and cover with respect to each other and wherein the basket has a plurality of openings configured to allow separated solids from the plate insert to pass therethrough.

4,533,345

UTERINE CATHETER

John A. Louw, Temecula, Calif., assignor to Fertility & Genetics Associates, Chicago, Ill.

Filed Jun. 14, 1983, Ser. No. 504,282
Int. Cl.³ A61M *3/00*
U.S. Cl. 604—43 **17 Claims**



1. An improved uterine catheter which comprises (a) at least two lumens at the forward distal end defined by an external tube and at least one internal tube, the tubes being coaxial to each other; (b) a forward distal end adapted for insertion into the human cervical canal and endometrial cavity and having a closed, rounded tip, said tip being adjacent to the forward distal end of the internal tube; (c) a cage attached distally to said closed tip and proximally to the distal end of the external tube, the cage surrounding the distal most end of the internal tube which is located coaxially therein, said distal most end of the internal tube having a means for delivering lavage fluid to the uterine cavity; (d) a rear proximal end, said end being adapted to permit separate connection of the internal and external tubes to a fluid supply and a recovery reservoir; said

catheter having an exterior diameter of about 7 to 16 French and having a combination of flexibility and stiffness sufficient to allow the catheter to describe a 10° to 30° angle per six centimeters when inserted into the uterine cavity, to conform to uterine contours and to be steerable within the uterine cavity.

4,533,346

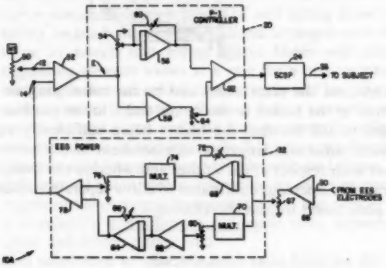
SYSTEM FOR AUTOMATIC FEEDBACK-CONTROLLED ADMINISTRATION OF DRUGS

Robert J. Cosgrove, Jr., Birmingham, Ala., and Victor F. Smolen, West Lafayette, Ind., assignors to PharmaControl Corporation, Englewood Cliffs, N.J.

Continuation of Ser. No. 239,818, Feb. 19, 1981, abandoned, which is a continuation of Ser. No. 52,242, Jun. 26, 1979, Pat. No. 4,280,494. This application Aug. 25, 1982, Ser. No. 411,473

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—66 **31 Claims**



1. An adaptive control system for administering a drug to a subject responsive to a drug/subject system model, comprising:

(a) means for sensing at least one physiological parameter of said subject and for converting said at least one parameter into a corresponding response signal;

(b) preset means for establishing a preset drug order signal;

(c) means for administering said drug to said subject in response to an actuating signal; and

(d) a control loop for providing said actuating signal to said means for administering, said control loop including:

(i) comparator means for accepting first and second input signals and producing an error signal representing the difference therebetween, said comparator means being connected to said preset means for accepting said order signal as a first input thereto;

(ii) response signal processing means connected to said sensing means for processing said response signal and for providing said processed response signal as a second input of said comparator means;

(iii) means for sampling said response signals and rates at which drugs are administered by said means for administering;

(iv) means for determining values for said drug/subject system model as a function of said sampled signals and rates and producing control signal information in accordance therewith;

(v) adaptive controller means for receiving said error signal from said comparator means and said control signal information from said means for determining, said adaptive controller means translating said error signal into an actuating signal for application to said administering means in accordance with said values for said drug/subject system model defined by said control signal to optimally minimize said error signal.

4,533,347

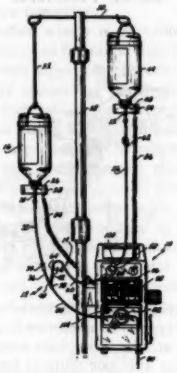
CONTROLLER FOR A DUAL DRUG DELIVERY SYSTEM

Clinton L. Deckert, Poway, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 19, 1983, Ser. No. 562,958

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—81 **6 Claims**



1. An apparatus for the administration of intravenous fluids to a patient comprising:

a first fluid container;

a primary administration set in fluid communication with said first fluid container;

a second fluid container;

a second administration set having a pinchable section and connected in fluid communication with said second fluid container;

a common tube for transferring fluid to the patient;

means for connecting said primary and said secondary administration sets in fluid communication with said common tube;

means for sequencing fluid flow through said secondary and said primary administration sets, said sequencing means comprising a check valve in the fluid lines of said primary administration set to prevent fluid flow in said primary administration set when the hydrostatic pressure in said secondary set exceeds the hydrostatic pressure in said primary set;

means for sensing actual flow rates through said secondary and said primary administration sets;

a controller having means operatively associated with said pinchable section to selectively prevent fluid flow through said secondary administration set, said controller further comprising means to preselect flow rates for said primary and secondary adminsitration sets, said controller operatively associated with said sensing means in said primary and secondary administration sets and having means for operatively engaging with said common tube to maintain the sensed actual flow rate at the respective preselected flow rate.

4,533,348

IN-LINE DRUG DISPENSER FOR USE IN INTRAVENOUS THERAPY

Allan M. Wolfe, South Laguna; James M. Davenport, Tustin; Felix Theeuwes, Los Altos, and Su I. Yum, Sunnyvale, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 518,490, Jul. 29, 1983, Pat. No. 4,474,574, which is a continuation of Ser. No. 338,206, Jan. 11, 1982, abandoned. This application Sep. 12, 1984, Ser. No. 649,778

The portion of the term of this patent subsequent to Oct. 2, 2001, has been disclaimed.

Int. Cl.³ A61M 5/14

U.S. Cl. 604—85 **1 Claim**

1. An intravenous system for delivering a drug formulation, wherein the intravenous system comprises:

(a) a reservoir of an intravenously acceptable fluid;

(b) a formulation dispenser in fluid communication with the reservoir, the formulation dispenser comprising:

(1) a housing surrounding an internal lumen, the housing having openings at its opposite ends;

(2) piston means disposed in one opening of the housing;

(3) a beneficial drug in the housing present in an effective amount for producing a therapeutic effect, said drug a member selected from the group consisting of solid, crystalline, granule, power, tablet, dried and lyophilized pharmaceutically acceptable forms that produce an intravenously administrable drug formulation when contacted by fluid that enters the dispenser;

(4) a fluid permeable membrane in the housing positioned between the drug and the piston;

(5) a closure disposed at the other opening of the housing facing the drug;

(6) inlet means in the housing for letting fluid enter the housing and contact the beneficial drug; and,

(7) outlet means in the housing for letting intravenously administrable drug formulation leave the housing.

4,533,349

SKIN MOUNTED DRAINAGE CATHETER RETENTION DISC

Jeffrey E. Bark, Tulsa, Okla., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Nov. 8, 1982, Ser. No. 439,739

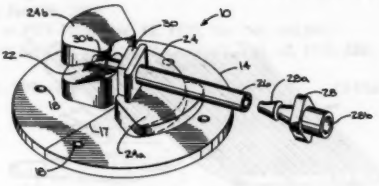
Int. Cl.³ A61M 25/02

U.S. Cl. 604—174 **5 Claims**

1. An improved skin mounted retention disc for retaining a drainage catheter indwelling comprising:

a substrate having a bore disposed therethrough dimensioned to receive a drainage catheter so that the catheter can be inserted through the disc and into the skin;

guide means integrated to said disc for engaging the drainage catheter to retain the drainage catheter to said disc; and



safety release connecting means for connecting the drainage catheter to a drainage bag and for breaking the connection between the drainage catheter and the drainage bag once said disc is displaced from the drainage bag, thereby avoiding separation of said skin mounted retention disc from the patient's skin.

4,533,350

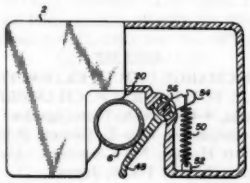
PARENTERAL SOLUTION DELIVERY CONTROL SYSTEM

Hal C. Danby, Palo Alto, and Carl Ritson, San Jose, both of Calif., assignors to Anatros Corporation, San Jose, Calif.

Filed May 10, 1983, Ser. No. 493,188

Int. Cl.³ A61M 5/16

U.S. Cl. 604—253 **5 Claims**



1. A parenteral solution delivery control system comprising a housing having a vertical support surface means in a recess defining a drip chamber zone, a bar means pivotally connected to the housing, the bar means being spring biased and positioned to swing toward the support surface means about an axis parallel to the axis of a drip chamber positioned against the vertical support surface means to contact the external surface of such a drip chamber, and when no drip chamber is in the recess, to swing into the drip chamber zone, said bar means including a deflector means for blocking a light path between a light source and a light detector through said drip chamber zone when the bar swings into the drip chamber zone.

4,533,351

FOAM RUBBER INSOLES CONTAINING OTTACIDE-P

Richard J. Washkuhn, Penfield, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Apr. 26, 1982, Ser. No. 371,969

Int. Cl.³ A43B 13/38

U.S. Cl. 604—293 **11 Claims**

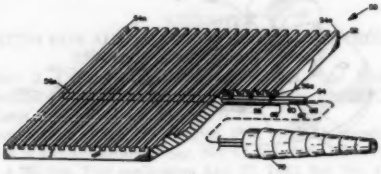
1. A foam rubber insole comprising from about 0.5% to about 5% by weight of tris(para-chloro-metaxylenol)borate, from about 0% to about 10% by weight of a deodorizing agent, and from about 85% to about 99.5% by weight of a cured latex.

4,533,352

MICROSURGICAL FLEXIBLE SUCTION MAT

Allen L. Van Beek, Minneapolis, and Alfred L. Iversen, Minnetonka, both of Minn., assignors to PMT Inc., Hopkins, Minn.

Filed Mar. 7, 1983, Ser. No. 472,757
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—317 **11 Claims**



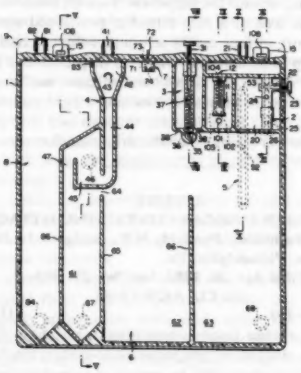
1. A microsurgical suction mat comprising:
a. pliable member means of a predetermined geometrical size;
b. plurality of suction port means positioned in a predetermined geometrical configuration through said pliable member means for providing for passage of fluid through said pliable member means;
c. geometrical member means provided for supporting exposed internal body organs such as arteries, nerves or the like extending upwardly from said pliable member means and about said suction port means;
d. hose means including a plurality of holes corresponding to and aligned with said suction port means of said pliable member means providing for suction of fluid from said pliable member to a point distant from said pliable member means and secured to a bottom of said pliable member means.

4,533,353

DRY TYPE DISCHARGE LIQUID EXTRACTION DEVICE FOR THE THORACIC CHAMBER

Sueshiro Akiyama, 4-41-6, Nishi-Tsutsujigaoka-Chofu, Tokyo, Japan (182), assignor to Alex E. Genson; Brian S. Genson, both of Hewlett Harbor, N.Y.; Sueshiro Akiyama and Yoshihiro Akiyama, both of Tokyo, Japan

Filed Jul. 19, 1982, Ser. No. 399,904
Claims priority, application Japan, Apr. 8, 1982, 57-57216
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—321 **12 Claims**



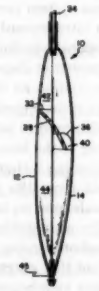
1. A dry tape discharge liquid extraction apparatus for a thoracic procedure comprising:
a container having a main body opened at the front side including,
a suction pressure adjusting chamber formed at the upper portion thereof and provided with a nozzle for connection to a suction source,
a liquid seal tube provided with a liquid seal chamber and a nozzle for connection to a human body cavity tube, and
a main storage chamber in communication with a liquid seal chamber of said liquid seal tube, and
a front plate secured on the front opened side of the main body,
the container being provided with,
a suction pressure adjusting valve means in communication with said suction pressure adjusting chamber and said main storage chamber,
a high negative pressure adjusting valve means for adjusting excess pressure in the human body cavity,
a valve means for releasing positive and negative pressure in said container, and
a suction pressure stabilizing valve in communication with said suction pressure adjusting chamber and outside air.

4,533,354

MEDICAL DRAINAGE BAG AND NON-RETURN VALVE ASSEMBLY

Ole R. Jensen, Rivervale, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Sep. 30, 1982, Ser. No. 432,072
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—323 **25 Claims**

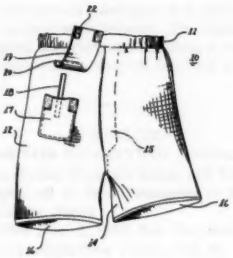


1. A non-return valve assembly for a medical drainage bag adapted to collect body fluids which includes a front face, a back face, a left side, a right side, a bottom and a top, which top has an inlet provided therein, said non-return valve comprising at least one baffle positioned intermediate the top and bottom of the bag and extending across the bag from its left side to its right side, each baffle being formed by a single, unitary piece of flexible material having an upper portion continuously attached to one of the faces only along a seam positioned below the inlet provided in the top of the bag and extending from the left side of the bag to the right side of the bag and a lower portion attached directly to the other face at spaced intervals between the left side of the bag and the right side of the bag to thereby form at least one opening positioned adjacent to the other face of the bag so as to permit liquid to flow readily from the top of the bag to the bottom of the bag while inhibiting liquid from flowing from the bottom of the bag to the top of the bag.

4,533,355
LOOSE-FITTING OSTOMY GARMENT

Marjorie A. Fair, 7707 W. Villa Theresa Dr., Peoria, Ariz. 85345

Filed May 3, 1984, Ser. No. 606,532
Int. Cl.[3] A61F 5/40; A41B 9/02
U.S. Cl. 604—345 7 Claims



1. A loose-fitting garment for individuals having a surgical stoma and an ostomy appliance fitted thereover for the collection of waste material, said garment comprising:

(a) encircling means for engaging the torso of the individual above the anatomical region containing the stoma and providing support for said garment;

(b) shield means extending downwardly from the encircling means for loosely covering the lower torso including said stoma region;

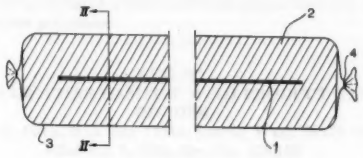
(c) at least one receiving means provided on the exterior of said shield means and positioned below said stoma region, said receiving means being dimensioned to removably receive the lower portion of an ostomy appliance therein; and

(d) an enlarged passageway formed in said shield means adjacent said receiving means and through which an upper portion of the ostomy appliance extends.

4,533,356
SURGICAL DEVICE

Stig Bengmark, Lund; Albert Broomé, Helsingborg, both of Sweden, and Christian H. Overland, Hundested, Denmark, assignors to Uno Plast A/S, Hundested, Denmark

PCT No. PCT/DK79/00058, § 371 Date Aug. 12, 1980, § 102(e) Date Aug. 12, 1980, PCT Pub. No. WO80/01239, PCT Pub. Date Jun. 26, 1980
PCT Filed Dec. 12, 1979, Ser. No. 201,062
Claims priority, application Denmark, Dec. 12, 1978, 5581/78
Int. Cl.[3] A61F 13/00
U.S. Cl. 604—358 10 Claims



1. A surgical device for holding internal body parts in place during surgical operations in body cavities and which, once bent into a desired shape, will retain the desired shape, the surgical device comprising

a rod-shaped member, said rod-shaped member being composed of a soft, liquid-absorbing material,

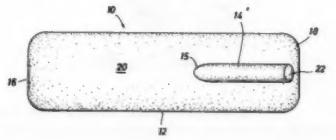
a non-elastically deformable, flexible member embedded in said rod-shaped member, and

an overwrap means surrounding said rod-shaped member.

4,533,357
SANITARY NAPKIN CONSTRUCTION

Frances E. Hall, Highway 90E, Box 19, Del Rio, Tex. 78840

Filed Apr. 21, 1983, Ser. No. 487,184
Int. Cl.[3] A61F 13/16
U.S. Cl. 609—401 5 Claims



1. A sanitary napkin comprising a generally elongate pad portion comprising an absorbent material for body fluid exudate, said pad portion having an anterior end and a posterior end and an absorbing surface side for generally overlaying the labia majora of the wearer, and a flexible tab portion projecting from said absorbing surface side, said tab portion being disposed closer to said posterior end of said pad portion, said tab portion having a length and a shape sufficient to be comfortably disposed between at least the lower portion of the buttocks of the wearer, said tab portion being covered by the anterior portion of said pad portion when said tab portion is disposed between said buttocks, said tab portion being comprised of an absorbent material to absorb body fluid exudate.

4,533,358

PROCESS FOR PRODUCING A SHAPED PRODUCT OF COLLAGEN BY SYNERESIS

Yoshimasa Yoden; Tsuneo Okuda, both of Osaka; Eiji Fuchigami, and Toshihiro Kuwabara, both of Nara, all of Japan, assignors to Nitta Gelatin Co., Ltd., Osaka, Japan

Filed Jul. 20, 1984, Ser. No. 632,855
Claims priority, application Japan, Sep. 29, 1983, 58-182437
Int. Cl.[3] C14C *5/00, 11/00*
U.S. Cl. 8—94.2 8 Claims

1. In a process for producing a shaped product of collagen by a wet or electrochemical method from a pasty composition comprising a collagenous substance or a mixture thereof with another high molecular substance, the improvement which comprises treating said composition with a crosslinking agent when said composition is shaped, freezing a shaped product and thawing it.

4,533,359

PROCESS FOR MODIFYING ANIMAL FIBERS

Takashi Kondo, Kyoto; Chikaaki Sakai, and Tadashi Karakawa, both of Haguri, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Nov. 5, 1982, Ser. No. 440,251
Claims priority, application Japan, Feb. 12, 1982, 57-21460
Int. Cl.[3] D06M *3/08, 3/10*
U.S. Cl. 8—128 R 17 Claims

1. A process for descaling animal fiber which comprises surface-oxidizing the animal fiber with an oxidizing agent and subsequently treating said fiber with a proteolytic enzyme in a saturated or nearly saturated aqueous inorganic-salt solution.

4,533,360

METHOD OF OBTAINING MAGNESIUM SULPHATE FROM MIXTURES OF SALTS

Giorgio Cozza, and Luigi Piccolo, both of Milan, Italy, assignors to Ing. Luigi Conti Vecchi S.p.A., Assemini, Italy

Filed Nov. 22, 1983, Ser. No. 554,492
Claims priority, application Italy, Nov. 25, 1982, 24431 A/82
Int. Cl.[3] B01D *9/02*
U.S. Cl. 23—298 7 Claims

1. Method of recovering magnesium sulphate with a purity of from 85% to 96% by weight, expressed as magnesium sulphate heptahydrate, from a starting mixture of magnesium sulphate heptahydrate and sodium chloride, comprising drying the starting mixture of magnesium sulphate heptahydrate and sodium chloride at a temperature of from 40° C. to 150° C. until the free water content of the dried mixture is less than 2% by weight; grinding said dried mixture until from 15% to 40% by weight thereof has a grain size of less than 0.044 mm.; and then separating the fine fraction.

4,533,361

MIDDLE DISTILLATE CONTAINING STORAGE STABILITY ADDITIVE

Rodney L. Sung, Fishkill, N.Y., and Thomas J. Karol, Norwalk, Conn., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 9, 1984, Ser. No. 658,933
Int. Cl.[3] C10L *1/22*
U.S. Cl. 44—73 27 Claims

1. A liquid middle distillate fuel composition comprising a major portion of a liquid middle distillate hydrocarbon fuel and a minor effective portion of additive prepared by

reacting (i) a primary or secondary polyamine, (ii) an aldehyde, and (iii) a phenol containing an active hydrogen thereby forming a phenol-aldehyde-amine condensate;

reacting said phenol-aldehyde-amine condensate with (iv) a succinic acid anhydride bearing a polyolefin-derived substituent containing residual unsaturation thereby forming product phenol-aldehyde-amine Mannich condensate polyamine succinimide; and

acylating said phenol-aldehyde-amine Mannich condensate polyamine succinimide with acylating agent thereby forming acylated phenol-aldehyde-amine Mannich condensate polyamine.

16. A product prepared by the process which comprises

reacting (i) a primary or secondary polyamine, (ii) an aldehyde, and (iii) a phenol containing an active hydrogen thereby forming a phenol-aldehyde-amine condensate;

reacting said phenol-aldehyde-amine condensate with (iv) a succinic acid anhydride bearing a polyolefin-derived substituent containing residual unsaturation thereby forming product phenol-aldehyde-amine Mannich condensate polyamine succinimide; and

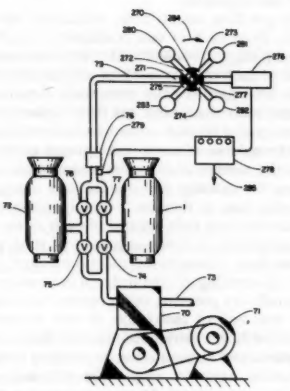
acylating said phenol-aldehyde-amine Mannich condensate polyamine succinimide with acylating agent thereby forming acylated phenol-aldehyde-amine Mannich condensate polyamine.

4,533,362

CYCLIC CHAR GASIFIER WITH PRODUCT GAS DIVIDER

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115-0514

Filed Jul. 5, 1984, Ser. No. 628,150
Int. Cl.[3] C10J *3/04, 3/22, 3/30, 3/82*
U.S. Cl. 48—61 11 Claims



1. A cyclic char gasifier plant comprising:

at least one compressor means for compressing gases from a lower pressure to a higher pressure and each such compressor comprising at least one stage and each such stage comprising a supply end and a delivery end;

means for driving each of said compressors;

at least one separate expander means for expanding gas from a higher pressure to a lower pressure and each such expander comprising at least one stage and each such stage comprising an inlet end and a discharge end;

at least two separate containers for containing char fuel;

at least two product gas collector pipes;

at least one reactant gas supply source;

each such compressor whose number of stages exceeds one further comprising fixed open gas flow connections from the delivery end of each compressor stage, except one, to the supply end of one other stage of said compressor, whereby said stages of said compressor are connected in series so that the pressure of a particular gas mass, at delivery from each stage, increases as said gas mass is compressed through said series connected stages, from the supply end to the delivery end of each stage, with the first stage in said series through which a gas mass first flows being both the lowest pressure stage and also that one stage whose supply end does not have a fixed open gas flow connection from the delivery end of any other stage

or said compressor, and with the last stage in said series through which a gas mass last flows being both the highest pressure stage and also that one stage whose delivery end does not have a fixed open gas flow connection to the supply end of any other stage of said compressor;

fixed open gas flow connections from the supply end of the lowest pressure stage of each of said compressors to at least one reactant gas supply source;

each such expander whose number of stages exceeds one further comprising fixed open gas flow connections from the discharge end of each expander stage, except one, to the inlet end of one other stage of said expander, whereby said stages of said expander are connected in series so that the pressure of a particular gas mass at discharge from each stage, decreases as said gas mass is expanded through said series connected stages, from the inlet end to the discharge end of each stage, with the first stage in said series through which a gas mass first flows being both the highest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the discharge end of any other stage of said expander, and with the last stage in said series through which a gas mass last flows being both the lowest pressure stage and also that one stage whose discharge end does not have a fixed open gas flow connection to the inlet end of any other stage of said expander;

changeable gas flow connections, which are openable and closeable, from each of said containers to each delivery end of each stage of each of said compressors and to each inlet end of each stage of each of said expanders;

each cyclic char gasifier plant comprising a number of said containers, with changeable gas flow connections to said compressors and to said expanders, at least equal to the sum of the number of compressor stages of all compressors and the number of expander stages of all expanders;

drive means for opening and closing said changeable gas flow connections so that, each container is opened for a time period to each delivery end of each stage of each of said compressors, in a sub-sequence of time periods of open gas flow connections to compressors, said sub-sequence proceeding in time order of increasing compressor stage delivery pressure, and is opened for a time period to each inlet end of each stage of said expanders, in a sub-sequence of time periods of open gas flow connections to expanders, said sub-sequence proceeding in time order of decreasing expander stage inlet pressure, said sub-sequence of connections to said compressor being followed by said sub-sequence of connections to said expanders, and these together comprise one sequence of time periods of open gas flow connections, each of said containers is opened to only one stage during any one time period of said sequence of time periods, said sequence of time periods of open gas flow connections to said compressors and to said expanders is repeated for each of said containers by said means for opening and closing;

at least one exhaust divider valve comprising, an inlet port, at least two discharge ports and means for connecting said inlet port to said discharge ports one port at a time;

fixed open gas flow connecting means for connecting at least one expander lowest pressure stage discharge end to one exhaust divider valve inlet port so that each exhaust divider valve inlet port is connected to but one expander lowest pressure stage discharge end;

fixed open gas flow connecting means for connecting each of said exhaust divider valve discharge ports separately to one of said product gas collector pipes, and for connecting each separate expander lowest pressure stage discharge, which is not connected to an exhaust divider valve inlet port, separately to one of said product gas collector pipes, so that each product gas collector pipe not connected directly to a separate expander lowest pressure stage discharge is connected to one discharge port of one exhaust divider valve, and so that the total number of product gas collector pipes equals the total number of separate expanders plus the total number of discharge ports on all exhaust divider valves minus the total number of exhaust divider valves;

drive means for driving each of said exhaust divider valve connecting means through its exhaust divider sequence of connectings between said inlets and said discharge ports so that, only one and always one discharge port of each exhaust divider valve is connected at any one time, each discharge port is connected at least once during each exhaust divider sequence of connectings, and said exhaust divider sequence of connectings is continuously repeated whenever said plant is running;

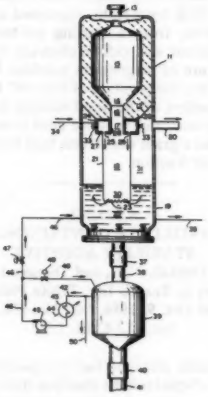
control means for controlling said drive means for opening and closing said changeable gas flow connections and said drive means for driving said exhaust divider valves so that, said repeated sequences of time periods of open gas flow connections are a continuous series of time periods for any one containing means, and so that the delivery end of each stage of each compressor has an open gas flow connection to at least one containing means, and the inlet end of each stage of each expander has an open gas flow connection to at least one containing means, during all time periods, and so that each exhaust divider sequence of any one exhaust divider valve starts concurrently with the start and ends concurrently with the end of each single exhaust divider sequence of all other exhaust divider valves, and so that each said time period starts concurrently with the starting of one of said exhaust divider sequences of connectings and ends concurrently with the ending of said same one exhaust divider sequence of connectings, whenever said plant is operating.

4,533,363

PRODUCTION OF SYNTHESIS GAS

Frederick C. Jahnke, Rye, and William B. Crouch, Chappaqua, both of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Jan. 20, 1984, Ser. No. 572,288
Int. Cl.³ C10J *3/46*
U.S. Cl. 48—197 R **6 Claims**



1. A process for the production of synthesis gas from an ash-containing carbonaceous fuel which comprises

gasifying said fuel in finely divided form in a gasification zone at superatmospheric pressure to produce a product synthesis gas containing particles of ash and unconverted fuel;

passing said particles of ash and unconverted fuel into water contained in a settling zone and in a lock hopper having a narrow valved connecting passageway therebetween, said ash and unconverted fuel during settling tending to collect in

the lower portion of the settling zone and to block the passageway and thereby prevent the passage of said particles of ash and uncoverted fuel from the lower portion of said settling zone into said passageway and thence into said lock hopper;

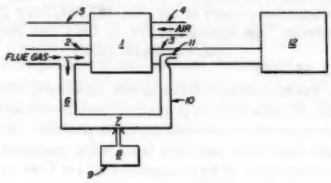
intermittently opening the valve in said connecting passageway thereby permitting the particles to pass through said valved passageway during a valve-open period; and intermittently during said valve-open period, applying force in addition to gravity for positively passing water through said valve from said settling zone into said lock hopper at a pressure higher than that in the lock hopper in order to increase the flow of water leaving the lower portion of said settling zone, passing through said valved passageway, and entering said lock hopper, thereby increasing the velocity and quantity of water passing through said valved passageway whereby positive flow of said particles is effected through said passageway during the valve-open period in which said valve in said valved passageway is open.

4,533,364

METHOD FOR FLUE GAS CONDITIONING WITH THE DECOMPOSITION PRODUCTS OF AMMONIUM SULFATE OR AMMONIUM BISULFATE

Ralph F. Altman, Chattanooga, Tenn.; John P. Gooch, Birmingham, Ala.; Edward B. Dismukes, Birmingham, Ala.; Roy E. Bickelhaupt, Birmingham, Ala., and Robert S. Dahlin, Birmingham, Ala., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 1, 1983, Ser. No. 462,754
Int. Cl.³ B03C *1/00*
U.S. Cl. 55—5 **8 Claims**



1. A method for conditioning flue gas containing suspended fly ash, comprising the steps of:

a. diverting a slipstream of flue gas from a main flue gas stream at a point upstream from an air preheater located directly upstream of an electrostatic precipitator where the temperature of said main flue gas stream is in the range of about 700° F. to 1000° F., said diverted stream thereby having a temperature in the range of from about 700° F. to 1000° F.;

b. introducing an aqueous solution of an ammonium salt selected from the group consisting of ammonium sulfate and ammonium bisulfate into said diverted flue gas slipstream thereby effecting thermal decomposition of said ammonium salt into its gaseous thermal decomposition products which include sulfur trioxide and ammonia; and

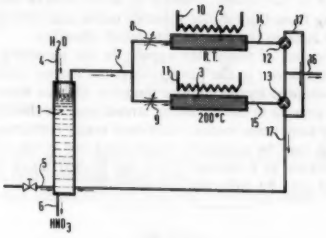
c. returning said diverted flue gas slipstream to said main flue gas stream at a point between said air preheater and said electrostatic precipitator thereby distributing said gaseous thermal decomposition products into said main flue gas stream flowing between said air preheater and said electrostatic precipitator.

4,533,365

PROCESS FOR THE SEPARATION AND RECYCLING OF NO_x GAS CONSTITUENTS THROUGH ADSORPTION AND DESORPTION ON A MOLECULAR SIEVE

Helmut Ringel, Niederzier-Hambach, Fed. Rep. of Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 512,032
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226840
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—28 **4 Claims**



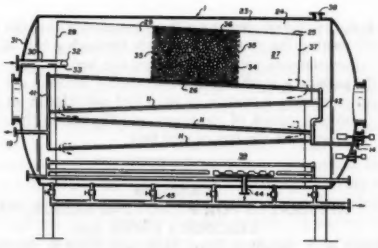
1. In a process for the separation and recycling of NO_x gas constituents through adsorption and desorption on a molecular sieve wherein, in alternating process steps, NO_x-containing waste gas initially flows through the molecular sieve until saturation of the molecular sieve with NO_x, and thereafter the NO_x is desorbed through the introduction of gas; the improvement comprising: heating the molecular sieve for regeneration to a temperature for desorbing the adsorbed NO_x; scavenging the molecular sieve with a portion of the NO_x-containing waste gas to produce a scavenging gas; and recycling the scavenging gas flow after passing through the molecular sieve wherein said waste gas comprises an untreated feed gas.

4,533,366

EVAPORATION DEHYDRATOR

Linden Bland, Calgary, Canada, assignor to Murphy Oil Company Limited, Calgary, Canada

Filed Mar. 27, 1984, Ser. No. 593,987
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—42 **7 Claims**



1. Apparatus for treating a pre-heated production well stream containing heavy oil, gas, solids, water and water vapor, comprising:

a vessel forming an internal chamber and having inlet means at its upper end for admitting the incoming stream, first outlet means for removing produced vapour, and second outlet means at its lower end for removing produced liquid, said vessel being adapted to operate at substantially atmospheric pressure;

a generally tubular member mounted in the chamber adjacent its upper end and forming an inclined, elongate passageway substantially closed in at its first end and along at least part of its length, said member having an outlet at its second end;

said inlet means communicating with the first end of the passageway;

means, extending transversely across the passageway at a point between its ends, for disintegrating foam present in the stream; and

a plurality of internally heated, stacked, angularly inclined trays forming a zigzag flowpath along which the stream may flow in a downward direction, said trays being positioned in the vessel chamber so as to receive the stream issuing from the tubular member outlet and deliver it to a sump zone in the base of the vessel chamber;

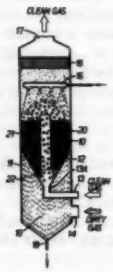
whereby part of the water vapour in the incoming stream may break out in the passageway, the foamy stream may be contained by the tubular member, at least some of the foam present in the incoming stream may be disintegrated by the transverse means, additional water remaining in the stream may be gradually vapourized and break out from the stream as it moves along the heated trays, and the stream may be collected for removal.

4,533,367

GAS SCRUBBING METHOD USING GAS LIQUID CONTACT IN A PARTICULATE BED

Dzemal Hadzismajlovi , 18 Kondina St., Belgrade, Yugoslavia

Filed Jul. 8, 1982, Ser. No. 396,297
Claims priority, application Australia, Jul. 10, 1981, PE9693
Int. Cl.³ B01D *47/14*
U.S. Cl. 55—91 **6 Claims**



1. A method of cleaning a dirty gas comprising the steps of:

(a) passing the dirty gas upwards through a bed of particulate material without fluidizing the bed,

(b) passing a wash liquid downwardly through the bed,

(c) entraining a portion of such bed particles in an upward-moving stream of clean gas, and depositing the entrained particles on the top of said bed.

4,533,368

APPARATUS FOR REMOVING RESPIRABLE AEROSOLS FROM AIR

Robert W. L. Snaddon, Burnt Hills, and Peter W. Dietz, Delanson, both of N.Y., assignors to Black & Decker, Inc., Newark, Del.

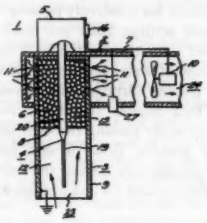
Filed Sep. 30, 1982, Ser. No. 429,764
Int. Cl.³ B03C *3/12, 3/68, 3/82*
U.S. Cl. 55—104 **27 Claims**

1. An apparatus for removing respirable aerosols from a gas comprising:

(a) a housing having a housing gas outlet;

(b) a chamber coupled to said housing, said chamber having a chamber gas inlet and a chamber gas outlet and including retaining means disposed within said chamber dividing said chamber into gas-communicating charging and bed regions, wherein said charging region is situated between said retaining means and said chamber gas inlet and said bed region is situated between said retaining means and said chamber gas outlet, said bed region including dielectric material through which gas from said charging region is passed;

(c) electrical means coupled to said housing for forming a



divergent corona discharge producing electric field within said charging region and for forming a substantially uniform electrical field within said bed region, said chamber as a unit being removable from and attachable to said housing and said electrical means as a unit; and

(d) electrical connecting means for coupling said electrical means to a high voltage power supply, whereby said aerosols are charged in the charging region and deposited on the surface of said material in the bed region.

4,533,369

GAS-PERMSELECTIVE COMPOSITE MEMBRANES AND PROCESS FOR THE PRODUCTION THEREOF

Koichi Okita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 382,981, May 28, 1982, abandoned. This application Feb. 3, 1984, Ser. No. 576,647
Int. Cl.³ B01D *53/22*
U.S. Cl. 55—158 **12 Claims**

1. A gas-permselective composite membrane comprising:

a heat-resistant porous polymeric membrane; and

a thin layer of cross-linked structure provided on one side of said membrane, said thin layer being prepared by plasma polymerizing, at an atmosphere of 1.0 Torr or less under glow discharge of from 20 to 80 W, a compound selected from the group consisting of 4-methyl-1-pentene, 4-methyl-2-pentene, 2,4,4-trimethyl-1-pentene, 4,4-dimethyl-1-pentene, tert-butylamine, and their fluorine-containing derivatives, or from the group consisting of vinyl trimethylsilane, hexamethyldisilazane, dimethylaminotrimethylsilane, and trimethylsilylimidazole.

8. A process for producing a gas-permselective membrane, comprising the steps of:

providing a heat-resistant porous polymeric membrane as a support;

feeding a compound selected from the group consisting of 4-methyl-1-pentene, 4-methyl-2-pentene, 2,4,4-trimethyl-1-pentene, 4,4-dimethyl-1-pentene, tert-butylamine, and their flourine-containing derivatives, or from the group consisting of vinyl trimethylsilane, hexamethyldisilazane, dimethylaminotrimethylsilane, and trimethylsilylimidazole, said compound being fed into an atmosphere of 1.0 Torr or less under glow discharge of from 20 to 80 W in order to polymerize the compound and form a thin membrane; and

depositing the thin membrane on the heat-resistant porous polymeric membrane.

4,533,370

ELECTRIC CLEANER WITH MINIMUM NOISE

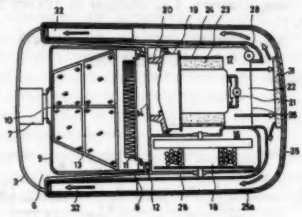
Katsuji Ikezaki, Sakai, and Kiyoshi Ishii, Nishinomiya, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 24, 1983, Ser. No. 478,328

Claims priority, application Japan, Mar. 30, 1982, 57-53553; Apr. 8, 1982, 57-59436; Apr. 8, 1982, 57-59437; Apr. 8, 1982, 57-59438

Int. Cl.³ B01D *46/00*

U.S. Cl. 55—276 5 Claims



1. A cleaner comprising:

a housing;

an air blower within said housing for drawing air and accompanying particles into said housing, and filter means for removing particles from said air; and

exhaust means for receiving air from said blower and for exhausting said air from said cleaner with a minimum of noise;

said exhaust means comprising an inlet portion adjacent one end of said housing for receiving said air from said blower, a plurality of outlet portions adjacent an opposite end of said housing for exhausting said air received by said inlet portion, and a plurality of air rectifying duct portions extending generally around external surfaces of said housing for at least substantially the length of said housing from said inlet portion at said one end to said respective outlet portions at said opposite end, each air rectifying duct portion receiving a portion of said air received by said inlet portion of said exhaust means; and

groove means formed on the external surface of the cleaner housing for receiving and supporting said air rectifying duct portions.

4,533,371

VACUUM CLEANER

Katsutoshi Nakamura, Nara, Japan, assignor to Kabushiki Kaisha SUIDEN, Osakashi, Japan

Filed Nov. 4, 1983, Ser. No. 548,831

Claims priority, application Japan, Apr. 25, 1982, 57-60876[U]; Apr. 25, 1982, 57-60877[U]

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—299 10 Claims

1. A vacuum cleaner comprising:

chamber means,

vacuum source means communicating with said chamber means,

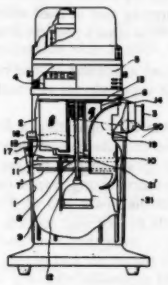
air inlet means,

rotatable shaft means axially supported within said chamber means,

filter means comprising at least one filter element radially arranged around said rotatable shaft means,

vibrating means for vibrating said filter means comprising at least one radially extending vane means fixed to said axially supported rotatable shaft, said at least one radially extending vane means being of sufficient length to physically contact said at least one filter element upon rotation of said rotatable shaft, and

driving means for rotating said vibrating means.



4,533,372

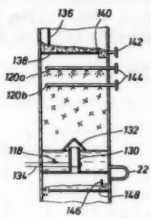
METHOD AND APPARATUS FOR SEPARATING CARBON DIOXIDE AND OTHER ACID GASES FROM METHANE BY THE USE OF DISTILLATION AND A CONTROLLED FREEZING ZONE

Jaime A. Valencia, Sugar Land, and Robert D. Denton, Houston, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Dec. 23, 1983, Ser. No. 565,089

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—12 76 Claims



1. A method for the separation of a feedstream containing methane and carbon dioxide comprising the steps of:

maintaining a first distillation zone engineered to produce an enriched carbon dioxide liquid bottoms stream and a freezing zone vapor feedstream and operated at a temperature and pressure at which substantially no carbon dioxide solids are formed within said distillation zone,

maintaining a freezing zone engineered to contact said freezing zone vapor feedstream with at least one freezing zone liquid feedstream containing methane at a temperature and pressure whereby both solids-containing carbon dioxide and a methane-enriched vapor stream are formed in said freezing zone,

introducing said feedstream into said first distillation zone,

producing said enriched carbon dioxide and said freezing zone vapor feedstream,

introducing said freezing zone vapor feedstream into said freezing zone,

contacting in said freezing zone said freezing zone vapor feedstream with at least one said freezing zone liquid feedstream,

forming in said freezing zone said solids containing carbon dioxide and said methane-enriched vapor stream,

melting said solids containing carbon dioxide and introducing a liquid stream containing said melted solids into said first distillation zone,

condensing at least a portion of the methane-enriched vapor stream and forming said at least one freezing zone liquid feedstream with at least a portion of said condensed vapor stream, and

recovering at least a portion of the remainder of the methane-enriched vapor stream as a methane-enriched product stream.

51. Means suitable for separating a feedstream containing methane and carbon dioxide comprising:

a first lower distillation section having an upper end and a lower end and containing vapor-liquid contact means, outlet means in the lower end of the section suitable for allowing liquids to exit said section, means for allowing reboiled liquid to enter the lower end, means for allowing liquids to enter the upper end of the section from a freezing section, and means for allowing vapor to exit the first lower distillation section into the freezing section while maintaining a liquid level within a lower end of said freezing section, and

a freezing section engineered to contact vapor from first lower distillation section with liquid to produce both solids containing carbon dioxide and methane-enriched vapor, said freezing section having an upper end and a lower end and containing spray means suitable for introducing a liquid into said section in a spray, and means for allowing said methane-enriched vapor to exit the upper end of the freezing section.

4,533,373
SEPARATION OF CO_2 AND H_2S FROM HYDROGEN CONTAINING GAS

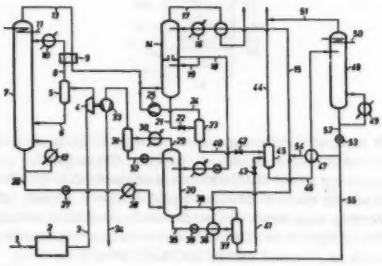
Peter Butz, Munich; Gerhard Ranke, Poecking, and Tran A. Tvan, Neuried, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 3, 1983, Ser. No. 500,697

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247773

Int. Cl.³ F25J 3/02

U.S. Cl. 62—17 **23 Claims**



1. In a process for the removal of acidic components comprising CO_2 and H_2S, from CO_2-rich, hydrocarbon-containing raw gas wherein the raw gas is scrubbed under pressure with a physical scrubbing medium selective for H_2S and COS as compared to CO_2 and hydrocarbons, and the resultant loaded scrubbing medium is regenerated and reused, the improvement comprising subjecting dry raw gas to rectification to form a hydrocarbon-rich fraction containing acidic components, as rectification overhead product, and a fraction consisting essentially of acidic components, as rectification bottoms product; scrubbing said rectification overhead product in a first scrubbing column to absorb the acidic components in the physical scrubbing medium to form a first scrubbing column bottoms product; vaporizing the rectification bottoms product; withdrawing partially loaded scrubbing medium from said first scrubbing column and scrubbing the vaporized rectification bottoms product in a second scrubbing column with said partially loaded scrubbing medium to selectively absorb the sulfur-containing compounds to form a loaded scrubbing medium; and discharging resultant scrubbed gas from the second scrubbing column as CO_2 overhead product under pressure and essentially free of sulfur compounds.

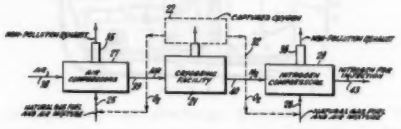
4,533,374
METHOD FOR REDUCING AIR POLLUTION

James W. Haag, Marrero, La., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,478

Int. Cl.³ F25J 3/04

U.S. Cl. 62—18 **6 Claims**



1. In a cryogenic facility located in a remote oil field and producing a large quantity of nitrogen for use in enhanced oil recovery and the like, said facility producing oxygen as a by-product, said facility employing a plurality of internal combustion engines at least one each for driving air and nitrogen compressors, said engines employing natural gas readily available in said remote oil field with air mixture for fuel whereby unacceptable levels of NO_x pollutants are generated by the exhausts from said engines, a method for reducing said air pollution by said engine exhausts at said facility, comprising:

capturing said by-product oxygen, and

feeding said captured oxygen into said fuel to reduce the NO_x compound content of the exhaust from said interal combustion engines.

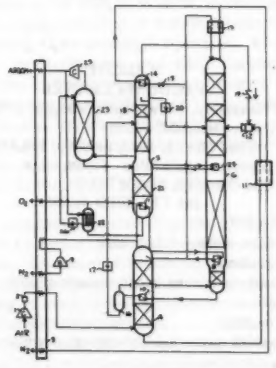
4,533,375
CRYOGENIC AIR SEPARATION WITH COLD ARGON RECYCLE

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Aug. 12, 1983, Ser. No. 522,516

Int. Cl.³ F25J 3/02

U.S. Cl. 62—22 **20 Claims**



1. In a process for separating air by cryogenic distillation comprising stripping argon from a liquid oxygen stream in an argon stripper and reducing the oxygen content of a gaseous

argon stream in an argon rectifier, the improvement comprising increasing the reboil rate through the argon stripper and rectifier using a compressor internal to the cold box by:

(a) compressing gaseous argon from the argon rectifier;

(b) condensing at least part of the compressed argon by latent heat exchange with boiling oxygen from the argon stripper;

(c) reboiling the argon stripper with at least part of the evaporated oxygen from step (b);

(d) refluxing the argon rectifier with at least part of the condensed argon from step (b).

9. In a cryogenic air separation apparatus for producing medium to high purity oxygen comprising a low pressure distillation column comprising at least an argon stripper and an argon rectifier, the improvement comprising means designed, sized, and arranged for increasing the reboil rate through the stripper and rectifier while minimizing the energy requirements, including:

(a) an argon compressor which is internal to the cold box;

(b) a vapor conduit from the rectifier to the compressor;

(c) a means for vaporizing argon stripper bottom liquid by latent heat exchange with a condensing gas;

(d) a vapor conduit from the compressor to the heat exchange means;

(e) a liquid conduit to transport condensed argon from the heat exchange means to the argon rectifier reflux inlet.

4,533,376

NOZZLE DRAWING PROCESS AND DRAWING NOZZLE FOR THE SEPARATION OF MELTS

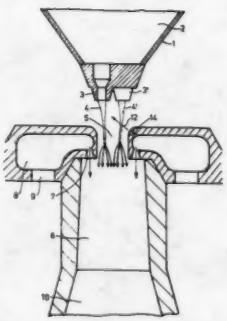
Edgar Muschelknautz, Leverkusen; Norbert Rink, Rommerskirchen, and George Chalupka, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 576,045

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305810

Int. Cl.³ C03B *37/06*

U.S. Cl. 65—5 **7 Claims**



1. In a process for the directing at least one gas propulsion jet from an opening in the inlet of the drawing nozzle in a range from perpendicular to the nozzle axis to laterally with a substantial component countercurrent to the melt stream entering the nozzle to increase the pressure gradient at the inlet.

4,533,377

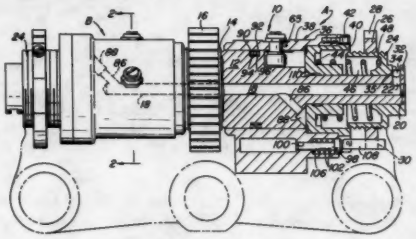
NECK RING MECHANISM FOR I.S. GLASS FORMING MACHINE

Harold C. Libert, Union City, Ind., assignor to Maul Technology Corporation, Millville, N.J.

Continuation-in-part of Ser. No. 572,478, Jan. 20, 1984, abandoned. This application May 3, 1984, Ser. No. 606,545

Int. Cl.³ C03B *9/44*

U.S. Cl. 65—232 **16 Claims**



1. A neck ring mechanism for use in an I.S. glass forming machine comprising:

a rock member adapted to be supported horizontally,

a pair of spaced cylinders reciprocable on said rock member for movement in opposite directions,

gear means coupled to said member for oscillating said member and cylinders about the longitudinal axis of said member,

longitudinal grooves on the periphery of said member,

a follower in each groove, each follower being supported by one of said cylinders,

means for adjusting at least one of said followers so that the follower contacts a side wall of an associated groove, and

said followers and grooves being arranged such that at least one pair of radially adjacent followers contact radially adjacent groove side walls of a cylinder so as to lock the cylinder on said rock member whereby backlash between said cylinder and rock member is eliminated.

4,533,378

MODIFIED ZIRCONIA INDUCTION FURNACE

Un C. Paek, West Windsor Township, Mercer County, and Charles M. Schroeder, Jr., North Hanover Township, Burlington County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed May 28, 1982, Ser. No. 383,066

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

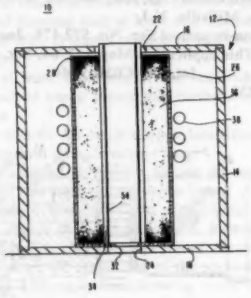
Int. Cl.³ C03B *37/01*

U.S. Cl. 65—3.12 **1 Claim**

1. A method of preventing particles from migrating from the surface of a tubular zirconium dioxide susceptor onto a light-guide fiber being drawn from a preform axially located within said susceptor, comprising the steps of:

vapor depositing a thin porous layer of silica soot on the inside surface of the zirconium dioxide susceptor; and

activating a high frequency induction coil, surrounding the susceptor, to heat said susceptor to consolidate the soot layer



to form a thin fused silica layer on the inside surface of the susceptor to prevent particles from migrating therefrom.

4,533,379

HERBICIDAL UREA COMPOUNDS

Robert van Helden; Frank Baardman, and Johannes L. M. Syrier, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

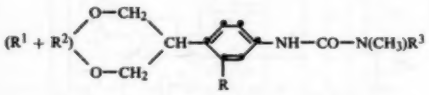
Filed Jun. 14, 1983, Ser. No. 504,349

Claims priority, application United Kingdom, Jun. 25, 1982, 8218455; Jul. 12, 1982, 8220141

Int. Cl.³ A01N *43/00*; C07D *319/00*

U.S. Cl. 71—88 **9 Claims**

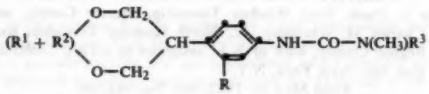
1. A compound of general formula Ia:



(Ia)

wherein R represents a chlorine atom or a methyl group; R^3 represents CH_3 and R^1 and R^2 together represent a cyclohexylidene group.

4. A compound of the formula



wherein R represents a halogen atom or a methyl group; R^3 represents H, CH_3 or OCH_3 and R^1 and R^2 together represent a cyclopentylidene group.

6. A herbicidal composition, which comprises a herbicidally effective amount of a compound according to claim 1 together with at least one carrier.

7. A composition according to claim 6, which comprises at least two carriers, at least one of which is a surface-active agent.

4,533,380

HERBICIDAL HETEROCYCLIC ESTERS OF 2-NITRO-5-(O-CHLORO-P-TRIFLUOROMETHYL-PHENOXY)-BENZOIC ACID AS COMPOSITIONS AND HERBICIDAL METHOD

Dieter Dürr, Bottmingen; Otto Rohr, Therwil, and Beat Böhner, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

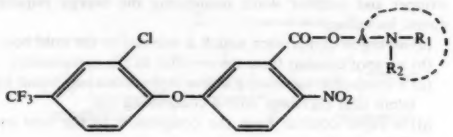
Division of Ser. No. 417,744, Sep. 13, 1982, Pat. No. 4,495,350, which is a division of Ser. No. 107,983, Dec. 28, 1979, Pat. No. 4,455,437. This application Nov. 1, 1984, Ser. No. 667,507

Claims priority, application Switzerland, Jan. 9, 1979, 168/79

Int. Cl.³ A01N *43/36, 43/40, 43/84*

U.S. Cl. 71—88 **11 Claims**

1. A herbicidal composition comprising (1) a heterocyclic ester of 2-nitro-5-(o-chloro-p-trifluoromethylphenoxy)-benzoic acid of the formula



wherein

A is a branched-chain or straight-chain C_2–C_4alkylene group,

R_1 and R_2 taken together with the nitrogen atom to which they are attached or R_1 and a carbon atom of A taken together with the nitrogen atom to which R_1 is attached for a 3- to 7-membered heterocyclic which optionally includes in its ring an oxygen atom, a sulfur atom or the group —NR_3— in which R_3 is hydrogen, C_1–C_4alkyl, phenyl or benzyl, and

R_2 when not forming part of the heterocyclic ring is hydrogen or C_1–C_4alkyl, and acid addition or quaternary ammonium salts thereof, and (2) an inert carrier.

4,533,381

NAPHTHYRIDINYLOXY(OR THIO)PHENOXY PROPANOIC ACIDS, DERIVATIVES THEREOF AND METHODS OF HERBICIDAL USE

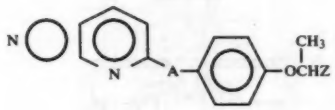
James A. Turner, Pittsburg, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 395,415, Jul. 6, 1982, Pat. No. 4,472,193. This application Sep. 17, 1984, Ser. No. 651,556

Int. Cl.³ C07D *487/04*; A01N *43/40*

U.S. Cl. 71—94 **17 Claims**

1. A compound of the formula



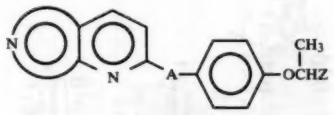
(II)

wherein

represents a fused six-membered nitrogen-containing aromatic ring which forms a 1,5-, 1,6-, 1,7- or 1,8-naphthyridinyl moiety with the adjoining pyridine ring, said naphthyridinyl moiety optionally being substituted at the 6-position of the naphthyridinyl moiety with a chloro, iodo, CF_3, bromo, or fluoro atom with the proviso that said

substitution occurs only when the 6-position of said naphthyridinyl moiety is occupied by a carbon atom;
A represents O or S;
Z represents —CONR'$_2$ or —CSNH$_2$; and
R' represents H or C$_1$–C$_4$ alkyl.

14. A method of controlling undesired plant growth which comprises applying to the locus of said plants a herbicidally effective amount of an active compound of the formula



(II)

wherein

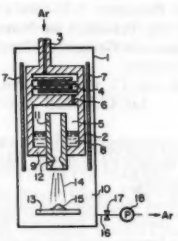
represents a fused six-membered nitrogen-containing aromatic ring which forms a 1,5-, 1,6-, 1,7- or 1,8-naphthyridinyl moiety with the adjoining pyridine ring, said naphthyridinyl moiety optionally being substituted at the 6-position of the naphthyridinyl moiety with a chloro, iodo, CF_3, bromo, or fluoro atom with the proviso that said substitution occurs only when the 6-position of said naphthyridinyl moiety is occupied by a carbon atom;
A represents O or S;
Z represents —CONR'$_2$ or —CSNH$_2$; and
R' represents H or C$_1$–C$_4$ alkyl.

4,533,382

DEVICE AND METHOD FOR MAKING AND COLLECTING FINE METALLIC POWDER

Hirohisa Miura; Hiroshi Sato; Toshio Natsume, and Hidenori Katagiri, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 8, 1984, Ser. No. 608,112
Claims priority, application Japan, May 10, 1983, 58-81536
Int. Cl.^{3} B22F *9/00*
U.S. Cl. 75—0.5 C **15 Claims**



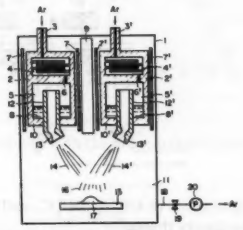
8. A method for making fine powder of a metal, comprising the steps of:
producing vapor of said metal;
mixing a flow of inert gas with said vapor of said metal to produce mixture gas;
rapidly cooling said mixture gas by adiabatically expanding it by passing it through a nozzle;
and collecting metal powder from a flow out from said nozzle.

4,533,383

DEVICE AND METHOD FOR MAKING AND COLLECTING FINE ALLOY POWDER

Hirohisa Miura; Hiroshi Sato; Toshio Natsume, and Hidenori Katagiri, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 8, 1983, Ser. No. 608,168
Claims priority, application Japan, May 10, 1984, 58-081538
Int. Cl.^{3} B22F *9/00*
U.S. Cl. 75—0.5 C **14 Claims**



8. A method for making fine powder of an alloy of a first metal and a second metal, comprising the steps of:
producing vapor of said first metal;
mixing a flow of inert gas with said vapor of said first metal to produce a first mixture gas;
rapidly cooling said first mixture gas by adiabatically expanding it by passing it through a first nozzle;
producing vapor of said second metal;
mixing a flow of inert gas with said vapor of said second metal to produce a second mixture gas;
rapidly cooling said second mixture gas by adiabatically expanding it by passing it through a second nozzle;
colliding together output flows from said first nozzle and said second nozzle to produce a combined flow;
and collecting alloy powder from said combined flow.

4,533,384

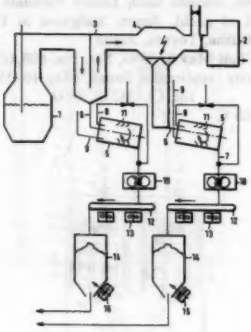
PROCESS FOR PREPARING BINDER-FREE HOT-BRIQUETS

Heinrich Rellermeyer, Duisburg, and Werner Kaas, Dinslaken, both of Fed. Rep. of Germany, assignors to Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte, Duisburg, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 504,772
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1982, 3223203
Int. Cl.^{3} C21B *13/00*
U.S. Cl. 75—0.5 BA **9 Claims**

1. A process for preparing binder-free hot-briquets for smelting purposes from ferrous pyrophorous, finely divided solids comprising before the briquetting stage, blowing an oxidising gas at a temperature of more than 200° C. through the finely divided dry solids containing more than 4% by weight of

metallic iron, at such a gas flow rate that some of the metallic iron is oxidised and thereby raising the temperature of the



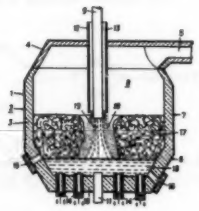
finely divided solids to 450° to 650° C., and hot-briquetting the solids immediately thereafter.

4,533,385

METHOD FOR PRODUCING METALS, SUCH AS MOLTEN PIG IRON, STEEL PRE-MATERIAL AND FERROALLOYS

Walter Lugscheider, Linz; Paul Müllner; Wilhelm Schiffer, both of Traun, and Alois Leutgöb, Steyr, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 5, 1983, Ser. No. 558,034
Claims priority, application Austria, Dec. 7, 1982, 4445/82
Int. Cl.³ C22B *4/00*
U.S. Cl. 75—10 R **3 Claims**



1. A method for producing metals including molten pig iron, steel pre-material and ferroalloys from metal-oxide-containing raw material in a metallurgical vessel having at least one plasma jet extending between a plasma burner in the top of said vessel and a counter electrode in the bottom of said vessel, which method comprises the steps of:

charging raw material in fine powder form through the top of said vessel in a direction parallel to and peripherally surrounding said jet,

blowing oxygen-containing gases and carbon into said vessel from the bottom of said vessel and through the melt formed therein, and

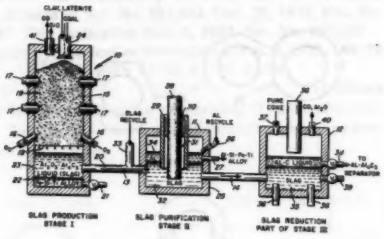
forming foamed slag within said vessel to surround said plasma jet and said peripherally charged raw materials, said foamed slag extending over the total height of said jet.

4,533,386

PROCESS FOR PRODUCING ALUMINUM

Robert M. Kibby, Lauderdale County, Ala., assignor to Process Development Associates, Inc., Florence, Ala.

Filed Mar. 27, 1984, Ser. No. 593,921
Int. Cl.³ C22B *21/02*
U.S. Cl. 75—10 R **17 Claims**



1. In a carbothermic process for producing aluminum metal including the step of reacting carbon bearing materials with molten slag comprising alumina and aluminum carbide, a method for producing said slag, the method comprising the following steps:

A. in a first reaction zone, heating a mixture containing sources of alumina, silica, iron oxide, titanium oxide and carbon to produce a first non-metallic melt, a reaction zone off-gas mixture containing silicon monoxide and carbon monoxide and a first molten metallic alloy containing a part of the iron, silicon and titanium derivable by reduction of said heated mixture with carbon;

B. in a second reaction zone, reacting the first non-metallic melt produced in step A with aluminum to reduce oxides of iron, silicon and titanium in said first non-metallic melt to their metallic states, thereby forming a second molten alloy containing aluminum, iron, silicon, and titanium and thereby converting said first non-metallic melt to a purified second non-metallic melt; and

C. recovering the purified second non-metallic melt from step B to provide said molten slag comprising alumina and aluminum carbide.

4,533,387

CHEMICAL PROCESS FOR PRODUCING ALKALI AND ALKALINE EARTH METALS

Gerhard Holland, Bernusstr. 7, D-6000 Frankfurt am Main 90, and Rudolf Nowak, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Gerhard Holland, Frankfurt am Main, Fed. Rep. of Germany

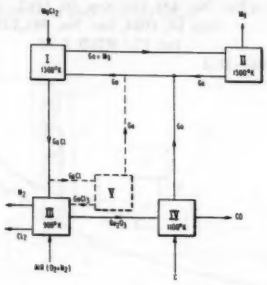
Filed Sep. 12, 1983, Ser. No. 531,402
Int. Cl.³ C22B *26/00*
U.S. Cl. 75—66 **7 Claims**

1. Process for producing alkali and alkaline earth metals as well as mixtures thereof by reducing their halides with reducing metals, comprising:

(a) reacting as least one halide with gallium, indium, thallium or mixtures thereof as reducing metals in a reduction chamber at a temperature below the boiling point of the reducing metal and at a vapor pressure in the reduction chamber which is smaller or at most equal to the reaction pressure, while elemental metal and the monohalide of the reducing metal are formed, and the amount of reducing metal being so chosen that it is sufficient for reducing the halide and dissolving at least part of the amount of metal formed;

(b) separating the vapor formed in the reduction from the metal-reducing metal melt and removing the vapor from the reduction chamber; and

(c) distilling off the metal from the metal-reducing metal melt in a fractionation chamber, removing the metal from



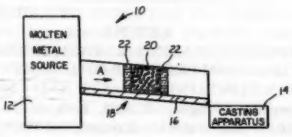
the process, and condensing the metal to provide liquid or solid metal.

4,533,388

TECHNIQUE FOR REMOVING IRON-RICH COMPONENTS FROM A COPPER MELT

Derek E. Tyler, Cheshire; Harvey P. Cheskis, North Haven, and Paul D. Tungatt, Middletown, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 11, 1984, Ser. No. 599,138
Int. Cl.³ C22B *15/00*
U.S. Cl. 75—76 **15 Claims**



1. A process for reducing the number of iron containing defects in a solid copper or copper base alloy comprising:

providing a copper or copper base alloy melt including iron containing components which result in defects in the solid alloy formed from said melt; and

substantially reducing the number of said defects in said solid alloy by providing contact between said melt and a silicon carbide containing material so that the silicon carbide captures defect forming iron containing components in said melt.

4,533,389

BORON CONTAINING RAPID SOLIDIFICATION ALLOY AND METHOD OF MAKING THE SAME

Deepak Kapoor, Saddle Brook; Chung-Chu Wan, Rockaway, and Rong Y. Wang, Pine Brook, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

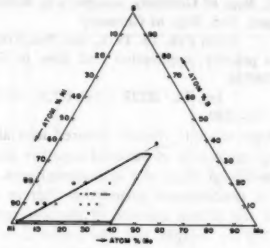
Filed Dec. 29, 1980, Ser. No. 220,618
The portion of the term of this patent subsequent to Jun. 18, 2002, has been disclaimed.
Int. Cl.³ F16H *29/10*
U.S. Cl. 75—123 B **5 Claims**

1. A single-phase, boride-free, homogeneous microcrystalline boron-containing alloy consisting of the formula:

$M_iT_jB_k$ where M is a metal selected from the group Ni, Fe, Co or a mixture thereof;

T is a refractory metal selected from the group Mo, W, or a mixture thereof;

B is the element boron; and i, j and k are the atomic percent of M, T and B and are between 45 and 82, 12 and 35, and



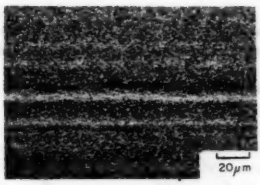
1 and 20 respectively with the proviso that $i+j+k=100\%$ and that $j>k$.

4,533,390

ULTRA HIGH CARBON STEEL ALLOY AND PROCESSING THEREOF

Oleg D. Sherby, Palo Alto, and Toshimasa Oyama, Stanford, both of Calif., assignors to Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Sep. 30, 1983, Ser. No. 537,793
Int. Cl.³ C21D *7/14*
U.S. Cl. 75—126 Q **19 Claims**



1. An ultra high carbon steel, consisting essentially of carbon in an amount of from about 0.8 weight percent up to the maximum solubility limit of carbon in austenite, silicon in an amount of from about 3 up to about 7 weight percent, an effective amount of a stabilizing element acting to stabilize iron carbides against graphitization in the presence of silicon, balance iron totalling 100 weight percent.

4,533,391

WORK-HARDENABLE SUBSTANTIALLY AUSTENITIC STAINLESS STEEL AND METHOD

Paul R. Borneman, Sarver, and James B. Hill, Natrona Heights, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Nov. 7, 1983, Ser. No. 549,700
Int. Cl.³ C22C *38/38*
U.S. Cl. 75—128 A **19 Claims**

1. A work-hardenable substantially austenitic stainless steel consisting essentially of, in weight percent, up to 0.08 max. carbon, up to 0.25 max. nitrogen, 12–15 chromium, 6.5 to 8.5 manganese, about 2 to less than 3.5 nickel, the sum of maganese and nickel being at least 9, and the balance iron and impurities, said steel being characterized by less than 15% ferromagnetic phases of ferrite and/or martensite in the cast and hot-processed conditions and increased strength resulting from martensite formation upon cold working the alloy an equivalent of up to 25% thickness reduction to final product without annealing.

4,533,392

HIGH STRENGTH SINTERED ALLOY

Friedrich J. Esper, Leonberg, and Robert Zeller, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,480

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2708916

Int. Cl.³ B22F *1/00*; C22C *38/02*

U.S. Cl. 75—230 2 Claims

1. A high strength ductile sintered iron alloy composition consisting essentially of sintered-together mixed powders or iron, iron-silicon alloy and iron-phosphorus alloy, with iron powder in predominant proportion therein and the mixture such that the silicon content of the sintered composition is about 1.5% by weight and the phosphorus content of the sintered composition is about 0.45%, with the balance being essentially iron, and the composition having a yield point above 400 N/mm^2 and an impact strength of more than 40 J/cm^2.

4,533,393

AQUEOUS CURABLE MOLDING COMPOSITIONS BASED ON INORGANIC INGREDIENTS AND PROCESS FOR THE PRODUCTION OF MOLDED PARTS

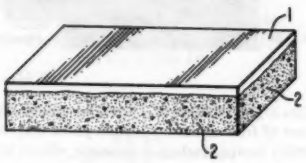
Karl H. Neuschaeffer, Leichlingen; Paul Spielau, Troisdorf-Eschmar; Günter Zoche, Bonn, and Hans-Werner Engels, Troisdorf-Sieglar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,222

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246604; Dec. 16, 1982, 3246602; Dec. 16, 1982, 3246619

Int. Cl.³ C09D *5/16*

U.S. Cl. 106—18.12 16 Claims



1. An aqueous, hardenable molding composition consisting essentially of inorganic components and water in a flowable or press-moldable distribution, said inorganic components comprising stone-forming components consisting of:

dissolved SiO_2;

1.3–10 parts by weight of a water-free oxide mixture containing amorphous SiO_2 and aluminum oxide per part of dissolved SiO_2;

0.7–2.5 parts by weight of K_2O or 0.55–1.5 parts by weight of Na_2O per part by weight of dissolved SiO_2 or equivalent amounts of the sodium oxide being used for equivalent amounts of the potassium oxide; wherein K_2O or Na_2O, respectively, is derived from at least one alkali hydroxide selected from the group consisting of sodium hydroxide and potassium hydroxide, an aqueous solution thereof, or an aqueous solution of at least one alkali silicate selected from the group consisting of sodium silicate and potassium silicate, and the dissolved SiO_2 is derived from an aqueous solution of at least one alkali silicate selected from the group consisting of sodium silicate and potassium silicate; said composition containing sufficient amounts of water up to attainment of flowability or press-moldability, respectively, and optionally amounts of inert fillers up to the limit of flowability.

4,533,394

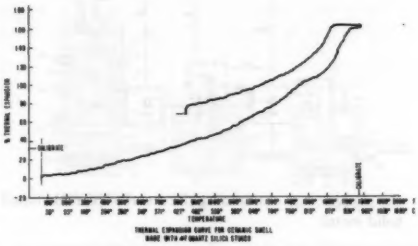
PROCESS FOR MANUFACTURING SHELL MOLDS

Claude H. Watts, 32261 Cedar Rd., Mayfield Heights, Ohio 44124

Division of Ser. No. 431,338, Sep. 30, 1982,. This application May 14, 1984, Ser. No. 591,121

Int. Cl.³ B28B *7/36*

U.S. Cl. 106—38.2 3 Claims



1. In the process of producing a shell mold about a disposable pattern, said process comprising coating said pattern with alternating layers of a liquid refractory slurry and particles of a stucco material, drying, removing the pattern and firing the mold; the improvement comprising at least one of said layers containing particles of an artificial stucco material produced by drying and crumbling particles comprising a mixture of refractory powder and an organic binder which is volatile at a firing temperature of 1600° F. and is present in amounts sufficient to bind said powder particles.

4,533,395

METHOD OF MAKING A LEACH RESISTANT FIXATION PRODUCT OF HARMFUL WATER-CONTAINING WASTE AND CEMENT

Peter Vejmelka; Wolfgang Kluger, both of Leopoldshafen; Rainer Köster, Karlsruhe-Groetzingen, and Wolfgang Hauser, Stutensee-Fr., all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,658

Claims priority, application European Pat. Off., Sep. 13, 1983, 83109027.9

Int. Cl.³ G21F *9/16*

U.S. Cl. 106—89 9 Claims

4. A method of producing solid fixation products of harmful water-containing waste materials and cement (fixation matrix) wherein the water-containing waste materials and the cement are mixed and, while being mixed, are subjected to evaporation at a temperature of 100° C. to 180° C. until sufficient water is evaporated so as to provide in the final fixation product a content of 20 to 50% by weight of waste material on the basis of the dry weight of the waste material in the fixation product and the mixture is then filled into forms for hardening.

4,533,396

METHOD FOR THE THERMAL TREATMENT OF MINERAL RAW MATERIALS

Horst Herchenbach, Hennef, and Hubert Ramesohl, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 548,840

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, 3248175

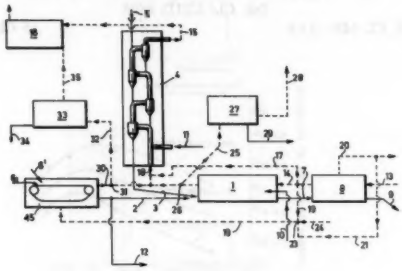
Int. Cl.³ C04B *7/36*

U.S. Cl. 106—100 6 Claims

1. A method for the thermal treatment of mineral raw materials for the manufacture of cement clinker which comprises:

providing separate first and second preheating systems, charging said first preheating system with a mixture of raw materials and fuel,

supplying sufficient heat to said first preheating system to produce calcined meal and exhaust gases,



passing exhaust gases from said first preheating system into said second preheating system for at least partially preheating and calcining the raw materials therein,

passing the calcined meal from both the first and second preheating systems into a burning system to form cement clinker, and

cooling the cement clinker in a cooling stage.

4,533,397

USE OF POLYMER ALLOYS BASED ON CELLULOSE ESTERS IN CONTACT OPHTHALMICS, AND CONTACT LENSES PRODUCED FROM THE POLYMER ALLOYS

Frank Wingler, Leverkusen; Helmut Waniczek, Cologne, and Otto-Christian Geyer, Wetzlar, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,178

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1983, 3314188

Int. Cl.³ C08L *1/08, 1/14*

U.S. Cl. 106—181 **9 Claims**

1. Contact lenses prepared from a polymer alloy essentially free from plasticizers and which comprises

(A) 97–70% by weight of one or more cellulose esters of one or more aliphatic carboxylic acids, and

(B) 3–30% by weight of an aliphatic polymeric compound having ester moieties, carbonate moieties or both ester and carbonate moieties in the polymer chain and having an average molecular weight of 2,000 to 300,000, with less than 2% by weight of compounds having a molecular weight below 500.

4,533,398

EXTRACTION OF SUCROSE

Richard W. Neuzil, Downers Grove, and Richard L. Fergin, Mt. Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

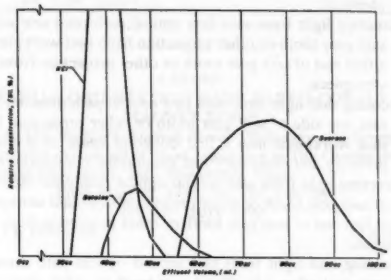
Division of Ser. No. 308,013, Oct. 2, 1981, Pat. No. 4,426,232, which is a continuation-in-part of Ser. No. 246,349, Mar. 23, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,903

Int. Cl.³ C13D *3/12*

U.S. Cl. 127—55 **1 Claim**

1. A cyclical process for separating sucrose from an aqueous solution of sucrose and at least one of the compounds comprising betaine and a mineral salt, each cycle of which process comprises:

(a) contacting said mixture at adsorption conditions with a solid adsorbent exhibiting selectivity for said sucrose thereby selectively adsorbing said sucrose on said adsorbent;



(b) recovering said sucrose from said adsorbent by desorption with a desorbent comprising alcohol; and thereafter

(c) flushing said alcohol from said adsorbent with water.

4,533,399

CONTACT LENS CLEANING METHOD

Arlene J. Mencke, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 12, 1983, Ser. No. 484,163

Int. Cl.³ B08B *11/00, 11/02*

U.S. Cl. 134—6 **15 Claims**

1. A method of cleaning a contact lens comprising the steps:

a. providing a moistened non-woven, thermoplastic, polymeric, fibrous web having an average fiber diameter up to 50 microns,

b. contacting and rubbing said lens with said fibrous web for a period of time sufficient to loosen proteinaceous and particulate matter from said contact lens, and

c. removing said lens from contact with said fibrous web, said lens after cleaning being physiologically acceptable to the eye.

4,533,400

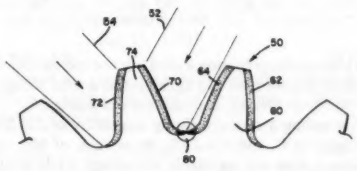
METHOD AND APPARATUS FOR LASER HARDENING OF STEEL

Gary F. Benedict, Chandler, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 29, 1983, Ser. No. 509,530

Int. Cl.³ B23K *27/00*

U.S. Cl. 148—4 **31 Claims**



1. A method of simultaneously hardening both sides of a gear tooth or other projection from a workpiece, comprising:

supplying a high power laser light beam;

periodically interposing at a high repetition rate a mechanical obstruction to substantially interrupt said high power laser light beam, said periodic interruption allowing the uninterrupted portion of said laser light beam to pass in a first optical path;

providing a reflective surface on said mechanical obstruc-

tion to direct the interrupted portion of said high power laser light beam in a second optical path, said interposing step being performed so as to cause the intensities of light in said first and second optical paths to be substantially identical;

directing light from said first optical path onto one side of said gear tooth or other projection from said workpiece at a first end of said gear tooth or other projection from said workpiece;

focusing said light from said first optical path directed onto said one side of said gear tooth or other projection from said workpiece into a first coherent beam of a desired intensity and cross-sectional geographic configuration;

directing light from said second optical path onto the other side of said gear tooth or other projection from said workpiece at said first end of said gear tooth or other projection from said workpiece;

focusing said light from said second optical path directed onto said other side of said gear tooth or other projection from said workpiece into a second coherent beam of a desired intensity and cross-sectional geographic configuration; and

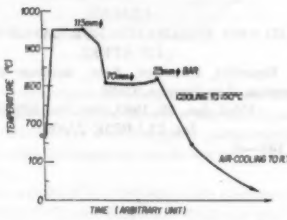
traversing said one side of said gear tooth or other projection from said workpiece from said one end to the other end with said first coherent beam while simultaneously traversing said other side of said gear tooth or other projection from said workpiece from said one end to said other end with said second coherent beam.

4,533,401

PROCESS FOR PRODUCING STEEL WIRE OR RODS OF HIGH DUCTILITY AND STRENGTH

Toshio Yutori, Takasago, and Rikuo Ogawa, Kobe, both of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation-in-part of Ser. No. 343,220, Aug. 4, 1983, abandoned. This application Aug. 4, 1983, Ser. No. 520,343
Claims priority, application Japan, Jan. 27, 1981, 56-11031
Int. Cl.³ C21D *8/06*
U.S. Cl. 148—12 B **2 Claims**



1. A process for preparing a steel wire or rod having a tensile strength of greater than 140 kg/mm² and a total elongation of about 10.6% or greater, said method consisting of:

(a) hot rolling a steel consisting essentially of 0.2–0.4%, by weight, of C, and 0.5–2.5%, by weight, of Mn, with the balance iron and inevitable impurities, while controlling the rolling conditions so that intermediate and final rolling temperatures are below 1000° C., and the total reduction ratio at temperatures below 930° C. is greater than 30%; thereby producing a steel consisting of hardened austenite having fine and uniform grains, and

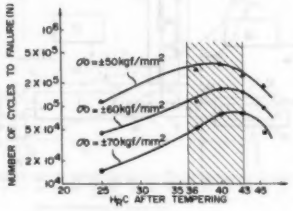
(b) continuously cooling said steel immediately after rolling to room temperature at an average cooling rate of 20°–250° C./sec., thereby forming a final phase in said steel of high ductility consisting essentially of martensite and a small amount of retained austenite.

4,533,402

METHOD OF MANUFACTURING A HOLLOW STABILIZER

Akira Ohno; Hiroshi Koyama, both of Yokohama; Kanji Inoue, Kamakura, and Hiroaki Ozawa, Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Feb. 16, 1984, Ser. No. 580,858
Int. Cl.³ C21D *9/08*
U.S. Cl. 148—12.4 **15 Claims**



1. A method of manufacturing a hollow stabilizer which comprises the step of:

bending a steel tubing containing 0.2–0.35 weight % of carbon and a minute amount of boron into a prescribed form;

heating said bent steel tubing;

rapidly water quenching said heated bent steel tubing to harden said bent steel tubing; and

tempering said water-quenched and hardened bent steel tubing to a hardness H_RC ranging between 36 and 43.

4,533,403

PACK COMPOSITION FOR BOROCARBURIZING FERROUS SUBSTRATES

William L. Aves, Jr., and Gary A. Aves, both of Arlington, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 547,302, Oct. 31, 1983, Pat. No. 4,449,006. This application Sep. 17, 1984, Ser. No. 651,386
Int. Cl.³ C21D *1/06*
U.S. Cl. 148—19 **6 Claims**

1. A pack composition for treating a ferrous metal to initially diffuse carbon into the surface thereof and subsequently diffuse boron therein, consisting essentially of:

(a) between about 3% and 20% by weight of boron material;

(b) between about 70% and 90% by weight of carburizing compound, said carburizing compound consisting essentially of:

(i) between about 10% and 30% by weight barium carbonate;

(ii) between about 5% and 20% by weight calcium carbonate; and

(iii) between about 50% and 85% by weight of a material selected from the group consisting essentially of hardwood charcoal and coke;

(c) between about 2% and 10% by weight of an alkali earth fluoride.

4,533,404

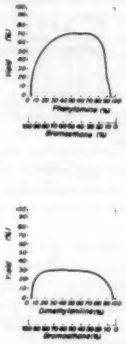
SOLDERING FLUXES

Masayuki Hasegawa, Hachioji, Japan, assignor to Nihon Almit Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1984, Ser. No. 614,737
Claims priority, application Japan, Jun. 1, 1983, 58-95745
Int. Cl.³ B23K *35/362*
U.S. Cl. 148—23 **6 Claims**

1. A soldering flux substantially comprising a chemical reaction product prepared by reacting at least one member selected

from the group consisting of bromoethane, 1,2-dibromoethane, and acetylene tetrabromide with at least one member selected



from the group consisting of phenylamine, methylphenylamine, dimethylaniline, and diethylaniline.

4,533,405

TUBULAR HIGH STRENGTH LOW ALLOY STEEL FOR OIL AND GAS WELLS

David L. Sponseller, Ann Arbor, Mich., and John A. Straatmann, Poland, Ohio, assignors to AMAX Inc., Greenwich, Conn.

Division of Ser. No. 433,326, Oct. 7, 1982, Pat. No. 4,453,986. This application Mar. 26, 1984, Ser. No. 593,659

Int. Cl.³ C22C *38/12*

U.S. Cl. 148—36 **4 Claims**

1. As an article of manufacture, a normalized high strength low-alloy steel tubular product of the N-80 type suitable for use as an oil well tubular member, said product being formed of a composition consisting essentially of:

about 0.25 to 0.4% C, about 0.2 to 0.4% Mo, about 0.002 to 0.03% N, about 0.75 to 1.5% Mn, about 0.1 to 0.4% Si, and the balance essentially iron, said steel product being normalized by heating to an austenitizing temperature of about 1600° F. to 1950° F. for a time sufficient to convert the microstructure to austenite and then air cooling to produce a product having N-80 type properties with a tensile strength substantially in excess of 100 ksi minimum for N-80 and characterized by a microstructure of predominantly acicular ferrite and some bainite.

4,533,406

MINIMUM ACTIVATION MARTENSITIC ALLOYS FOR SURFACE DISPOSAL AFTER EXPOSURE TO NEUTRON FLUX

Thomas Lechtenberg, San Diego, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 26, 1983, Ser. No. 517,364

Int. Cl.³ C22C *38/22, 38/24, 38/28*

U.S. Cl. 148—37 **5 Claims**

1. A steel alloy for long term exposure to a high neutron flux, said steel having a martensitic microstructure and containing between about 8.0 and 12.0 weight percent chromium, between about 0.1 and about 0.25 weight percent carbon, between about 2.2 and about 2.0 weight percent tungsten, and between about 0.2 and about 0.4 weight percent vanadium, and said steel having a controlled amount of Ni, Mo, Cu, N, Co, Nb, Al, and Mn such that

$5.14 \times 10^{-3}\chi_{Ni} + 1.43 \times 10^{-2}\chi_{Mo} +$

-continued

$2.45 \times 10^{-2}\chi_{Cu} + 1.8 \times 10^{-3}\chi_{N} +$
$1.2 \times 10^{-5}\chi_{Co} + 10\chi_{Nb} + 8.44 \times 10^{-3}\chi_{Al} +$
$1.6 \times 10^{-5}\chi_{Mn} < 1.$

4,533,407

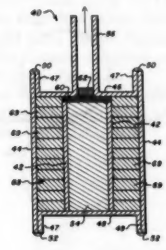
RADIAL ORIENTATION RARE EARTH-COBALT MAGNET RINGS

Dilip K. Das, Bedford; Kaplesh Kumar, Wellesley, and Ernest C. Wettstein, Acton, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 30, 1981, Ser. No. 248,798

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—102 **25 Claims**



1. A method for forming radially oriented magnets comprising the steps of:

compressing a fine grain powder of magnet material in an annular cavity in the presence of a radially aligning magnetic field to form a compacted continuous ring the particles of which are aligned in a radial orientation;

stacking a plurality of rings formed by said compressing step axially in a sealed cannister formed of a compatible deformable at the temperature used for densification of said compacted rings;

subjecting the cannister to temperatures in the range of 900° to 1150° C. and gas pressures sufficiently high to compact the rings into a single cylindrical magnet having a density of at least 99% of the theoretical maximum; and

cooling the cannister containing the magnet.

4,533,408

PREPARATION OF HARD MAGNETIC ALLOYS OF A TRANSITION METAL AND LANTHANIDE

Norman C. Koon, Woodridge, Va.

Division of Ser. No. 314,325, Oct. 23, 1981, Pat. No. 4,402,770. This application Sep. 6, 1983, Ser. No. 529,788

Int. Cl.³ H01F *1/02*

U.S. Cl. 148—103 **20 Claims**

1. A method for preparing a hard magnetic polycrystalline alloy which comprise the steps of preparing an alloy represented by the formula:

$$(M_wX_xB_{1-w-x})_{1-y}(Y_vR'L_{1-v-z})_y$$

wherein v is from 0 to 0.8, w is from about 0.7 to about 0.98; x is from 0 to about 0.15; y is from about 0.05 to about 0.25; z is from 0 to about 0.95; M is selected from the class consisting of iron, cobalt, an iron-cobalt alloy, an iron-manganese alloy having at least 50 atomic percent iron, an iron-cobalt-manganese alloy having at least 50 atomic percent iron and cobalt, X is an auxillary glass former selected from the class consisting of phosphorous, silicon, aluminum, arsenic, genmanium, indinum, antimony, bismuth, tin, and mixtures thereof, R' is a heavier-weight lanthanide, and L is a lighter weight lanthanide, said alloy having a polycrystalline, multiphase, single-

domain microstructure wherein the average crystal-grain size does not exceed 400 A;

creating an amorphous microstructure in said alloy;

heating said alloy at a temperature from about 850 to 1200 K. in a magnetic field of at least one kOe until a polycrystalline microstructure is obtained.

4,533,409

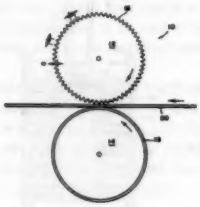
METHOD AND APPARATUS FOR REDUCING CORE LOSSES OF GRAIN-ORIENTED SILICON STEEL

James G. Benford, Pittsburgh, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Dec. 19, 1984, Ser. No. 683,839

Int. Cl.[3] H01F *1/04*

U.S. Cl. 148—111 **11 Claims**



1. A method for improving the core loss of grain-oriented silicon steel, which has been cold rolled to final gauge, said method comprising scribing said steel after said cold rolling in a direction generally transverse to the rolling direction; said scribing being effected by passing said steel after said cold rolling through a roll pass defined by an anvil roll and a scribing roll having a roll surface with a plurality of projections thereon and said anvil roll being constructed from a material that is relatively more elastic than the material from which said scribing roll is constructed.

4,533,410

PROCESS OF VAPOR PHASE EPITAXY OF COMPOUND SEMICONDUCTORS

Mototsugu Ogura, Nara; Yuzaburoh Ban, Osaka, and Nobuyasu Hase, Hyogo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 17, 1983, Ser. No. 542,770

Claims priority, application Japan, Oct. 19, 1982, 57-183945

Int. Cl.[3] H01L *21/205, 21/365*

U.S. Cl. 148—175 **22 Claims**

1. A metal-organic chemical vapor deposition process for forming a compound semiconductor, comprising the steps of:

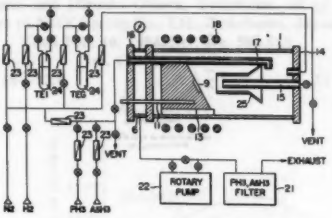
disposing a substrate in a deposition chamber;

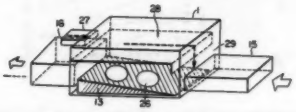
introducing a first reactant gas comprising a metal organic compound into said chamber, so that said gas flows from an upstream region toward a downstream region within the chamber;

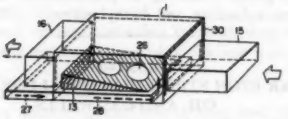
providing a heated guide tube having a wall extending between said regions in said chamber;

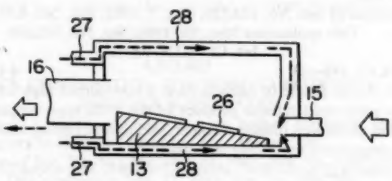
feeding a thermally decomposable second reactant gas through said guide tube from said downstream region to said upstream region, while heating at least a portion of the wall of the guide tube to a temperature sufficient to at least partially pre-decompose said second reactant gas and reduce deposition of at least one decomposition product of said second reactant gas on the inner surface of said guide tube;

mixing said first and second reactant gases in said upstream region; and









supplying the resulting mixture of said gases to a surface of said substrate, so that a layer comprising said compound semiconductor is formed on said surface.

4,533,411

METHOD OF PROCESSING NICKEL-TITANIUM-BASE SHAPE-MEMORY ALLOYS AND STRUCTURE

Keith N. Melton, Cupertino, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 15, 1983, Ser. No. 553,005

Int. Cl.[3] C22F *1/10, 1/18*

U.S. Cl. 148—402 **11 Claims**

1. A method of processing nickel-titanium-base shape-memory alloys to substantially suppress the two-way effect which comprises:

providing a nickel-titanium-based shape-memory alloy in the austenitic state in a specified shape;

cold working said alloy in the martensitic state from 15% to 40% to provide a microstructure containing a high concentration of substantially random dislocations;

annealing said alloy without restraint at 300° C. to 500° C. for at least 20 minutes to rearrange the dislocations into an ordered network of dislocations comprising essentially dislocation-free cells surrounded by walls of higher dislocation density;

providing said alloy in a desired shape while maintaining the dislocation-free cells obtained in the annealing step; and

deforming the alloy in the martensitic state; whereby when

the alloy is recovered by heating the alloy to the austenitic state and subsequently cooled to the martensitic state, the alloy substantially retains said desired shape.

9. A coupling member produced by the process of processing nickel-titanium-base shape-memory alloys to substantially suppress the two-way effect which comprises:

providing a nickel-titanium-base shape-memory alloy in the austenitic state in a specified shape;

cold working said alloy in the martensitic state from 15% to 40% to provide a microstructure containing a high concentration of substantially random dislocations;

annealing said alloy without restrain at 300° C. to 500° C. for at least 20 minutes to rearrange the dislocations into an ordered network of dislocations comprising essentially dislocation-free cells surrounded by walls of higher dislocation density and to provide said alloy in a desired shape; and

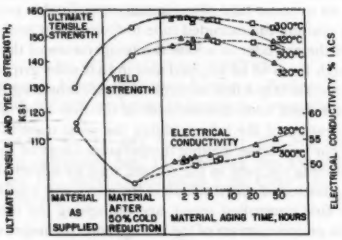
deforming the alloy in the martensitic state; whereby when the alloy is recovered by heating the alloy to the austenitic state and subsequently cooled to the martensitic state, the alloy will revert to the martensitic state without exhibiting the two-way effect.

4,533,412

THERMAL-MECHANICAL TREATMENT FOR COPPER ALLOYS

Abraham I. Rotem, San Diego, Calif., assignor to FDX Patents Holding Company, N.V., La Jolla, Calif.

Filed Sep. 30, 1982, Ser. No. 428,624
Int. Cl.³ C22F 1/08; C22C 9/06
U.S. Cl. 148—411 **25 Claims**



1. A method of enhancing the strength and hardness properties of a starting copper alloy having a copper matrix structure containing at least one element in solution capable of being precipitated, said starting material having been cold worked and subjected to a precipitation hardening heat treatment for on the order of about 2 to 72 hours at a temperature in the range of about 300°–500° C. comprising the steps of additional cold working followed by an additional precipitation hardening heat treatment to produce a material having a tensile strength of at least 150 ksi and a tensile ductility of at least 5%, said copper alloy consists essentially of the composition by weight of

beryllium: 0.2–0.6
cobalt: 0.3 maximum
nickel: 1.4–2.2
nickel, beryllium & copper: 99.5 minimum
iron: 0.1 maximum.

23. A precipitation hardenable copper alloy having a tensile strength of at least 150 ksi and a tensile ductility of at least 5% produced by a method comprising the steps of:

(a) providing a copper alloy which consists essentially of the composition by weight of:
beryllium: 0.2–0.6
cobalt: 0.3 maximum
nickel: 1.4–2.2
nickel, beryllium & copper: 99.5 minimum
iron: 0.1 maximum

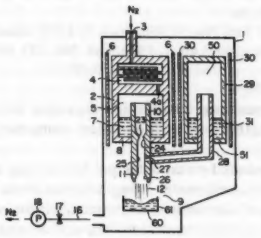
(b) solutionizing the alloy;
(c) quenching the solutionized alloy;
(d) cold working the quenched alloy;
(e) precipitation hardening the cold worked alloy for on the order of about 2–72 hours at a temperature in the range of about 300°–500° C.;
(f) additionally cold working the precipitation hardened alloy; and
(g) additionally precipitation hardening the additionally cold worked alloy.

4,533,413

REINFORCED MATERIAL INCORPORATING FINE COMPOSITE POWDER AND METHOD AND APPARATUS FOR MAKING THE SAME

Hirohisa Miura; Hiroshi Sato; Toshio Natsume, and Hidenori Katagiri, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 8, 1984, Ser. No. 608,113
Claims priority, application Japan, May 10, 1983, 58-081535
Int. Cl.³ C22C 23/02
U.S. Cl. 148—420 **16 Claims**



1. A composite material, comprising a matrix of a first metal and reinforcing first particles with average particle diameter less than or equal to about ten microns dispersed in said matrix of said first metal, said reinforcing first particles each having a composite structure which comprises a plurality of fine second particles of a ceramic and a matrix of a second metal.

4,533,414

CORROSION-RESISTANCE NICKEL ALLOY

Aziz I. Asphahani, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed Jul. 10, 1980, Ser. No. 168,237
Int. Cl.³ C22C 19/05
U.S. Cl. 148—427 **1 Claim**

1. The wrought product form of an alloy consisting essentially of, in weight percent, about 22 chromium, about 13 molybdenum, about 3 tungsten, less than 0.5 columbium, less than 0.5 tantalum, less than 0.1 carbon, less than 0.2 silicon, less than 0.5 manganese, about 3 iron, less than 0.7 aluminum plus titanium, less than 0.5 vanadium and the balance nickel plus impurities wherein the ratio of molybdenum to tungsten is within the range 3:1 to 5:1, wherein the ratio of iron to tungsten is within the range 1:1 to 3:1, and wherein said ratios provide said alloy with an optimum combination of corrosion resistant properties in a variety of corrosive media and hot and cold working properties to permit production of thin sheet, tubing and other commercial forms.

4,533,415
HIGH ENERGY PROPELLANT

Frederick B. Wagner, III, R.D. #2, Margarete Dr., Box 679, Elmer, N.J. 08318, and Anthony J. Izbicki, Reading, Pa., assignors to Frederick B. Wagner, III, Elmer, N.J.

Filed Sep. 23, 1977, Ser. No. 836,887
Int. Cl.[3] C06B 35/00
U.S. Cl. 149—35 20 Claims

1. A high energy propellant comprising a normally pulverulent secondary high explosive held together as a cohesive mass by means of a bridging agent which is a clathrate having a plurality of hydrogen-active sites.

4,533,416
PELLETIZABLE PROPELLANT

Donald R. Poole, Woodinville, Wash., assignor to Rockcor, Inc., Redmond, Wash.

Continuation of Ser. No. 91,965, Nov. 7, 1979, abandoned. This application Aug. 7, 1981, Ser. No. 291,148
Int. Cl.[3] C06B 35/00
U.S. Cl. 149—35 18 Claims

1. A gas generating composition formable into pellets of enhanced strength made by the process comprising the steps of:

forming a hydrated metal oxide gel by reacting a base with a metal salt, said metal being selected from the group consisting of aluminum, magnesium, chromium, manganese, iron, cobalt, copper, nickel, cerium and of the remaining transition series elements which form a gelatinous hydrated metal oxide when the salts thereof are reacted with a base;

mixing said hydrated metal oxide gel with a metal oxide oxidant chosen from the group consisting of the oxides of aluminum, magnesium, chromium, manganese, iron, cobalt, copper, nickel, cerium and of the remaining transition series elements which form a gelatinous hydrated metal oxide when the salts thereof are reacted with a base;

dehydrating the hydrated metal oxide in the presence said metal oxides oxidant; and

adding a metal azide chosen from the alkali and alkaline earth azides.

10. A method of making a gas generating composition formable into pellets of enhanced strength comprising the steps of:

forming a hydrated metal oxide gel by reacting a base with a metal salt, said metal being selected from the group consisting of aluminum, magnesium, chromium, manganese, iron, cobalt, copper, nickel, cerium and of the remaining transition series elements which form a gelatinous hydrated metal oxide when the salts thereof are reacted with a base;

mixing said gel with a particulate metal oxide oxidant chosen from the group consisting of the oxides of aluminum, magnesium, chromium, manganese, iron, cobalt, copper, nickel, cerium and of the remaining transition series elements which form a gelatinous hydrated metal oxide when the salts thereof are reacted with a base;

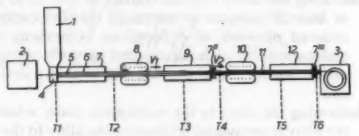
dehydrating the hydrated metal oxide in the presence of said particulate metal oxide oxidant: and

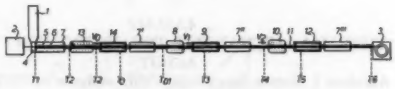
adding a metal azide chosen from the alkali and alkaline earth azides.

4,533,417
MANUFACTURE OF ORIENTED INSULATED WIRES AND CABLES

Robert T. Puckowski; Dennis Cooper, both of London, and Patrick J. Duffy, Marlow, all of England, assignors to BICC Public Limited Company, London, England

Filed Jul. 12, 1984, Ser. No. 630,109
Claims priority, application United Kingdom, Jul. 19, 1983, 8319510
Int. Cl.[3] H01B 13/14
U.S. Cl. 156—51 5 Claims





1. In a method of continuously manufacturing an electric wire or cable comprising advancing a core comprising at least one conductor in the direction of its length; extruding around the core an oversize tube of a selected crystallisable polymeric material; cooling the extruded tube to form a first zone downstream of the extruder in which the temperature of the tube is low enough for it to be gripped and in that zone gripping the tube to advance it at a first controlled speed; reheating the tube to form a second zone downstream of the first zone in which the temperature of the tube is above the glass transition temperature but below the melting temperature range of the polymer; stretching the tube in the second zone by advancing it at a second controlled speed which is from one and a half to ten times the first controlled speed; and collapsing the tube onto the core in or downstream of the second zone the improvement which comprises holding the extruded tube at a place upstream of the place in the first zone where it is gripped in a temperature range above the glass transition temperature but below the crystalline melting point for a time to produce crystallinity in the material of the tube before it is stretched.

4,533,418
POLYURETHANE HEAT FORM AND BONDING OF CABLE JACKETS

James Appling, Canoga Park, Calif., assignor to Allied Corporation, Morristown, N.J.

Filed Sep. 21, 1984, Ser. No. 652,932
Int. Cl.[3] H01B 13/06
U.S. Cl. 156—52 6 Claims

1. In the manufacture of electrical cables including internal conductors, insulating material protecting said conductors, a protective polyurethane jacket and metallic connector members terminating said cables wherein said connector members must be sealed to said protective polyurethane jacket in such manner as to resist the penetration of an external fluid under high pressure, a method of bonding said jacket to itself and to said connector members comprising the steps of:

(1) splitting the jacket longitudinally from the end of the cable into two roughly equal halves and peeling the split ends back;

(2) attaching said metallic connector member to the remaining portion of said cable;

(3) cleaning the metal surface of said connector member to remove all residual grease or oil;

(4) priming the external metal surface of said connector member with a thermoplastic adhesive which will adhere to metal and to polyurethane;

(5) repositioning the split halves of said jacket around said cable and over the surface of said connector member and placing the end of said cable including the length of said split halves and said metallic connector in a mold wherein said mold is in close contact with said jacket;

(6) applying heat and pressure in said mold in a quantity and for a time sufficient to cause said polyurethane jacket material to flow sufficiently to bond said halves together and to bond said jacket to said metallic connector member; and

(7) allowing said mold to cool to a temperature substantially below that required to bond said polyurethane jacket material, and removing said cable from said mold.

4,533,419

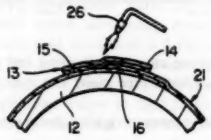
PATCH CLOSURE SYSTEM

George Pieslak, Menlo Park, and Barnie A. Wallace, Jr., Palo Alto, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 317,092, Nov. 2, 1981, Pat. No. 4,424,246. This application Sep. 15, 1984, Ser. No. 533,164

Int. Cl.³ B29C *27/00;* **B32B** *3/26;* **C09J** *7/02*

U.S. Cl. 156—85 **4 Claims**



1. A method of covering a substrate with a heat recoverable sheet material comprising the steps of:

a. overlappingly wrapping said sheet material about said substrate:

b. disposing a patch over a line defined by the uppermost of the overlapping end, said patch comprising:

(i) a layer of cross-linked polymer and means for retaining the line before, during and after heat recovery of said sheet material;

(ii) the retaining means including means centrally located on the patch for retaining the line before and during heat recovery consisting of a pressure sensitive adhesive with reinforcing means for preventing movement of the pressure sensitive with respect to the polymer during heat recovery;

(iii) the retaining means further including means for retaining the line after heat recovery occupying the remainder of the surface of the patch consisting of heat-activatable adhesive.

4,533,420

TOOTHED BELT

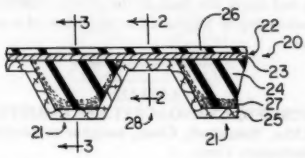
Robert E. Wetzel, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 378,978, May 17, 1982, Pat. No. 4,415,397, which is a division of Ser. No. 217,261, Dec. 16, 1980, Pat. No. 4,343,666, which is a continuation of Ser. No. 110,032, Jan. 7, 1980, abandoned, which is a division of Ser. No. 957,280, Nov. 2, 1978, Pat. No. 4,235,119. This application Jun. 27, 1983, Ser. No. 508,209

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.³ F16G *1/28*

U.S. Cl. 156—138 **10 Claims**



1. In a method of making a belt construction having opposed sides and comprising a tensile means intermediate said opposed sides, a plurality of teeth defining one of said opposed sides of said belt construction and being mainly formed of a first polymeric material that has reinforcing fibers therein, each tooth having opposed sides that are disposed in spaced relation to adjacent sides of adjacent teeth, and a backing member defining the other of said opposed sides of said belt construction, said backing member being mainly formed from a second polymeric material that is initially separate from said material of said teeth and is substantially free of fibers therein, said material of said backing member having a surface that joins with a surface of each tooth whereby said joining surfaces define an interface line therebetween, the improvement comprising the step of forming said interface line for each tooth to extend from a point that is intermediate the opposed sides of said tensile means and is spaced inwardly from one of said opposed sides of the respective tooth into the medial portion of said respective tooth and then back to a point that is intermediate the opposed sides of said tensile means and is spaced inwardly from the other of said opposed sides of said respective tooth whereby part of said material of said backing member defines part of the medial portion of each tooth.

4,533,421

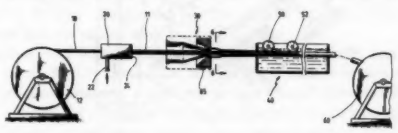
METHOD FOR MAKING A LAP SEAM EXTRUDED TENDON

David Pattridge, Shreveport, La., assignor to Pattridge Post Tension, Inc., Shreveport, La.

Filed Apr. 25, 1984, Ser. No. 603,760

Int. Cl.³ B29C *19/00*

U.S. Cl. 156—244.12 **7 Claims**



1. A method of making a tendon suitable for post tensioning concrete and for use in other applications, comprising the steps of:

coating a multiple-wire strand with a corrosion inhibitor;

moving the coated strand through a crosshead of an extruder;

extruding a heated, curled, discontinuous strip of plastic material from the crosshead and generally coaxially around the moving, coated strand such that the plastic material generally encircles the coated strand, with at least a portion of the ends of the extruded strip overlapping, and at least a portion of the overlapping end sections being in the upper portion of the curled strip as viewed in cross section;

pulling the curled plastic strip by the moving coated strand to form a jacket around the coated strand for the tendon; and

applying pressure to the overlapping sections of the plastic strip and using the heat of the plastic material from the extrusion step to facilitate the formation of a seal therebetween.

4,533,422

THIXOTROPIC CYANOACRYLATE COMPOSITIONS

Alan E. Litke, Naugatuck, Conn., assignor to Loctite Corporation, Newington, Conn.

Continuation-in-part of Ser. No. 528,275, Aug. 31, 1983, Pat. No. 4,477,607. This application Aug. 13, 1984, Ser. No. 639,976

The portion of the term of this patent subsequent to Oct. 16, 2001, has been disclaimed.

Int. Cl.³ C08K *9/02, 5/54;* **C09J** *5/00, 5/02*

U.S. Cl. 156—307.3 **13 Claims**

1. In a composition comprising an α-cyanoacrylate ester monomer and a thixotropic agent, the improvement comprising that said thixotropic agent is a fumed silica having a surface treated with a polydimethylsiloxane and is present in an amount of between about 0.5 and 12%.

4,533,423

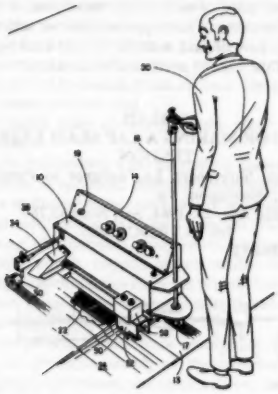
PORTABLE SEAM WELDING MACHINE FOR THERMOPLASTIC SHEETS

A. Neil Johnson, Gahanna, and Philip A. Taylor, Columbus, both of Ohio, assignors to G.R. Systems, Inc., Columbus, Ohio

Filed May 29, 1984, Ser. No. 614,637

Int. Cl.³ B32B *31/26*

U.S. Cl. 156—359 **12 Claims**



1. An improved portable seam welding machine for joining sheets of thermoplastic resins, said machine being of the type having wheels, a drive motor connected through a drive train to at least one of said wheels, heating means and feed means for feeding the opposed, overlapping edges of said sheets through the machine, wherein the improvement comprises the combination of:

(a) a start/stop switch means for alternately starting and stopping the machine;

(b) heating means connected to said start/stop switch for alternately being actuated and deactuated; and

(c) motor speed control means connected to said switch means and said motor for alternately gradually accelerating said motor to full speed and gradually decelerating said motor to a stop in response to actuation of said start/stop switch and in accordance with a selected algorithm.

4,533,424

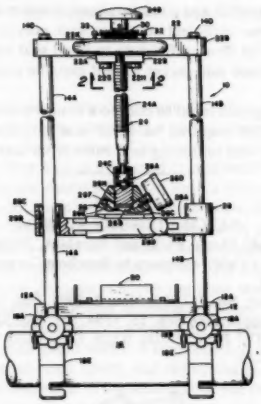
PIPE FUSION APPARATUS WITH LOAD CELL FOR ATTACHING SIDE WALL FITTINGS

Arthur H. McElroy, Tulsa, Okla., assignor to McElroy Manufacturing, Inc., Tulsa, Okla.

Filed Jan. 13, 1984, Ser. No. 570,389

Int. Cl.³ B29C *17/00, 27/00;* **B29D** *31/00;* **B29F** *5/00*

U.S. Cl. 156—378 **6 Claims**



1. In apparatus having means for heating and joining plastic sidewall fittings to a plastic pipe main; the improvement comprising:

(a) a base plate with means to rigidly clamp said base plate to a pipe main;

(b) at least two parallel spaced support rods attached to said base plate at a selected angle; the axis of said support rods intersecting the axis of said pipe main;

(c) movable clamp means by said fitting guided to slide along said support rods; the axis of movement of said movable clamp means intersecting the axis of said pipe main;

(d) said support rods at their free ends attached to and guided by a support plate; said support plate at a selected distance from said base plate, and supporting an engageable thread means;

(e) threaded drive screw means passing perpendicularly through said support plate and said engageable thread means; the axis of said drive screw intersecting the axis of said pipe main; means to rotate said drive screw;

(f) load cell means attached at a first part to said movable clamp means; and means to attach one end of said drive screw means to a second part on said load cell; and

(g) means associated with said load cell to indicate at any selected time, the force exerted by said drive screw on said load cell.

4,533,425

APPARATUS FOR SECURING A VALVE TO A WRAPPER SLEEVE

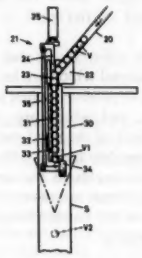
Peter Wehle, Neuhausen am Rheinfall, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jun. 17, 1983, Ser. No. 505,398

Claims priority, application Switzerland, Jun. 18, 1982, 3781/82

Int. Cl.³ B29D *23/10*; B65H *1/16*

U.S. Cl. 156—466 4 Claims



1. An apparatus for consecutively applying relief valves to a wrapper sheet fed to the apparatus, comprising

(a) a chute defining a substantially vertically oriented inner track for receiving the valves in a series;

(b) channel means for supplying the valves to said chute and introducing the valves into said track;

(c) retaining means for alternatingly holding back and releasing a momentarily lowermost valve in said track; said retaining means comprising a resilient cam engaging the momentarily lowermost valve in said track;

(d) valve advancing means for intermittently causing the momentarily lowermost valve to clear said retaining means; said valve advancing means including a ram aligned with said track and a drive means connected to said ram for alternatingly advancing and withdrawing said ram; said ram being arranged for abutting a momentarily uppermost valve in said track for advancing the valve series in said track upon advance of said ram;

(e) welding means situated below said retaining means adjacent said chute externally thereof for cyclically bonding a valve to the wrapper sheet;

(f) positioning means situated underneath said retaining means for aligning the valve released by said retaining means with said welding means; said positioning means including a pivotal pawl having an operative position for abutting a valve passing beyond said retaining means and an inoperative position clear of a travelling path of the valves determined by said track;

(g) connecting means operatively coupling said pawl to said drive means for moving said pawl into said operative position when said drive means advances said ram and for moving said pawl into said inoperative position when said drive means withdraws said ram;

(h) web guiding means for passing the wrapper sheet between said positioning means and said welding means; and

(i) cutting means situated above said welding means for cyclically providing an opening in the wrapper sheet at the intended location of the valves to be bonded thereto by said welding means.

4,533,426

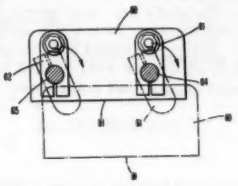
LABELING MACHINE

Frank V. N. Hoagland, Palm Harbor, Fla., and Agostino J. Aquino, Patterson, N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Oct. 20, 1982, Ser. No. 435,611

Int. Cl.³ B29C *17/00*; B32B *3/04*; B31F *5/00*; B65H *29/00*

U.S. Cl. 156—492 10 Claims



1. A labeling machine for applying labels to fin sealed ends of packages, comprising in combination: a conveyor moving along a line serially past first and second label folding stations, a flat surface extending parallel to said conveyor at said first folding station, and conveyor being adapted to carry a plurality of packages with their fin sealed ends lying flat on said surface, a means for placing a first portion of a label on a first side of the fin sealed end of each package as it moves toward said first label folding station, a second portion of said label extending past the edge of the fin seal, a first means for holding said labels in place on said fin sealed ends, a first label folding device at said first station including a first moving plate plow member having a generally straight label-contacting edge for engaging the label and thereby folding the free end of the label at right angles to the fin sealed end, said first label folding device having two shafts respectively fixedly connected to two arms, each arm having a portion rotatably connected to said first plow member, a means for rotatably driving at least one of said two shafts of said first label folding device, such that rotation of said at least one of said two shafts causes motion of said first plow member in a cyclical motion with said label-contacting edge of said first plow member being continuously generally parallel to a plane containing said label and moving only in a plane generally perpendicular to said first portion of said label; a second means for folding disposed between said first and second folding stations holding the folded second portion of said label at generally right angles to said fin sealed end, and a second label folding device including a second moving plate plow member having a generally straight label-contacting edge at said second folding station for engaging and thereby folding said second portion of label against a second side of said fin sealed end;

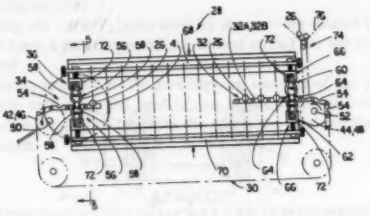
said second label folding device having two shafts respectively fixedly connected to two arms, each arm having a portion rotatably connected to said second plow member, a means for rotatably driving at least one of said two shafts of said second plow member in a cyclical motion with said label-contacting edge of said second plow member being continuously generally parallel to a plane containing said first portion of said label and moving only in a plane generally parallel to said first portion of said label;

whereby a compound fold is made in each label about fin sealed ends of packages.

4,533,427
DEVICE FOR MAKING GROOVES IN CIGARETTE FILTERS

Steven P. Reed, Felton, and Erik I. Naslund, Los Gatos, both of Calif., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 18, 1984, Ser. No. 631,961
Int. Cl.[3] A24D *3/04*
U.S. Cl. 156—500 10 Claims



1. An apparatus for forming grooves in filter rods comprising:

endless conveyor means having a generally horizontal top flight for intermittently moving filter rods through the apparatus;

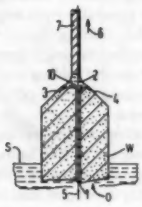
means associated with the endless conveyor means for holding the filter rods at predetermined spaced apart intervals on the horizontal top flight of the endless conveyor means; and,

groove forming means disposed at the top flight of the endless conveyor means for forming grooves in the filter rods in the holding means, the groove forming means including at least one pair of articulated grooving fingers located generally below the horizontal top flight and at least one pair of articulated grooving fingers located generally above the horizontal top flight.

4,533,428
METHOD AND DEVICE FOR ASYMMETRICALLY COATING A TAPE-SHAPED CARRIER BODY WITH SILICON FOR FURTHER PROCESSING INTO SOLAR CELLS

Josef Grabmaier, Berg; Richard Falckenberg, Unterhaching, and Helmut Fölle, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,732
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1982, 3231267
Int. Cl.[3] H01L *21/208*
U.S. Cl. 156—608 1 Claim



1. A method for asymmetrically coating a tape-shaped carrier body with crystallized silicon, for further processing into solar cells, said method comprising

moving a tape-shaped carrier body along a generally vertical carrier path leading out of a melt vat containing a silicon melt, with the carrier body moving generally vertically as it moves above a melt surface in the vat,

causing molten silicon from the melt to be applied to the carrier body at a crystallization region of the generally vertical carrier path so that the molten silicon crystallizes on the carrier body, and

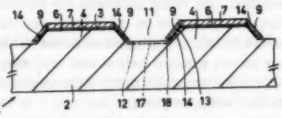
physically constraining the molten silicon by means of solid material at each side of the generally vertical carrier path in the vicinity of the crystallization region to cause the molten silicon to be asymmetrically distributed on the respective sides of the carrier path in the vicinity of the crystallization region such that the silicon is coated predominantly on one side of the carrier body, wherein the molten silicon is caused to rise from the silicon melt to a crystallization region above the melt surface along the generally vertical carrier path as a result of capillary forces,

with the physically constraining step being effected by surfaces of solid material which are located at the crystallization region so as to receive molten silicon as a result of the capillary forces, and which are wetted by the molten silicon, the surfaces of the solid material at the respective sides of the carrier path having different dimensions in the direction at right angles to the carrier path to provide corresponding different extents of the molten silicon at the respective sides of the carrier body in the vicinity of the crystallization region.

4,533,429
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Wilhelmus J. M. J. Josquin, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 23, 1983, Ser. No. 535,124
Claims priority, application Netherlands, Oct. 8, 1982, 8203903
Int. Cl.[3] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 9 Claims

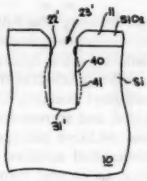


1. A method of manufacturing a semiconductor device comprising mutually dielectrically insulated semiconductor regions, in which the starting material is a semiconductor body having a major surface covered by an etching mask which exposes parts of the major surface, and said parts are subjected to an anisotropic etching treatment to form a depression by removal of material, the bottom and side walls of said depression being coated with an oxide layer and a layer of oxidation-resistant material disposed thereon, which layers are then removed from the bottom of the depression, after which the device is subjected to a selective oxidation treatment so that the depression is filled with oxide, characterized in that, before said selective oxidation treatment begins, a part of the oxide layer on the side walls of the depression under an edge of the layer of oxidation-resistant material near the bottom of the depression is removed by under-etching.

4,533,430
PROCESS FOR FORMING SLOTS HAVING NEAR VERTICAL SIDEWALLS AT THEIR UPPER EXTREMITIES

Robert W. Bower, Los Gatos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 4, 1984, Ser. No. 567,971
Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—643 **13 Claims**



1. A process for fabricating slots in a wafer of semiconductor material wherein the slots have nearly vertical sidewalls near the mouth of the slot, comprising the steps of:

applying an etch-resistant mask material to the surface of said wafer of semiconductor material;

patterning said mask material to expose regions in said substrate in which slots are to be formed;

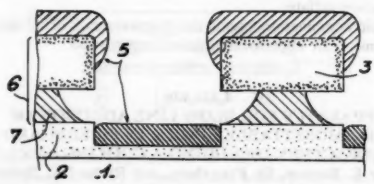
etching said exposed regions in said substrate to form said slots; and

forming an etch resistant coating on the walls of said slots while they are being formed whereby said etch resistant coating protects said sidewalls near the mouth of the slot from unwanted etching so they retain a nearly vertical shape.

4,533,431
PROCESS FOR PRODUCING CONDUCTORS FOR INTEGRATED CIRCUITS USING PLANAR TECHNOLOGY

Bruno Dargent, Grenoble, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 13, 1984, Ser. No. 570,506
Claims priority, application France, Jan. 13, 1983, 83 00436
Int. Cl.³ B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*
U.S. Cl. 156—643 **6 Claims**

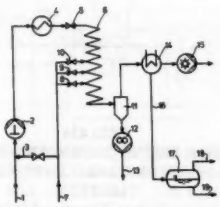


1. A process for producing conductors for integrated circuits using planar technology, wherein a coating of an insulating material is deposited on a substrate, a masking sheet is deposited on the insulating material coating, windows corresponding to the conductors to be obtained are cut from this masking sheet down to the insulating material coating, the insulating material coating is etched facing the windows, a conductive material is deposited on the masking sheet and in the etched parts of the insulating material coating facing the windows, the masking sheet and the conductive material covering the same are removed, the improvement wherein the masking sheet is deposited as a metallic coating covering the insulating material and a resin coating covering the metallic coating and the windows are cut from the masking sheet by first cutting the resin coating along the windows and then undercutting the metallic coating along the windows so that the edges of the metallic coating on the peripheries of the windows are set back from the corresponding edges of the resin coating thereby avoiding conductive material bridging between the masking sheet and the etched parts of the insulating material facing the windows that could inhibit removal from the substrate of the masking sheet and the conductive material covering the same.

4,533,432
CONTINUOUS PROCESS FOR THE CONCENTRATION OF W/O-EMULSIONS BY EVAPORATION

Gerd Goldmann; Georg Spott, and Christian Fröhlich, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 507,148
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224994
Int. Cl.³ B01D *1/02*
U.S. Cl. 159—47.1 **4 Claims**



1. A continuous process for the concentration by evaporation of W/O-emulsions of the type accumulating in the emulsion polymerization of ethylenically-unsaturated, water-soluble monomers, comprising precluding polymer precipitation on the heat exchange surfaces of a helical multiphase flow tube with at least two phase streams by converting a W/O-emulsion having a water content of more than 25% by weight and a polymer content of from 28 to 40% by weight in vacuo at temperatures of from 80° to 140° C. into a non-aqueous polymer dispersion in oil having a residual water content adhering to the polymer of less than 14% by weight (based on polymer) and a polymer content of from 45 to 65% by weight.

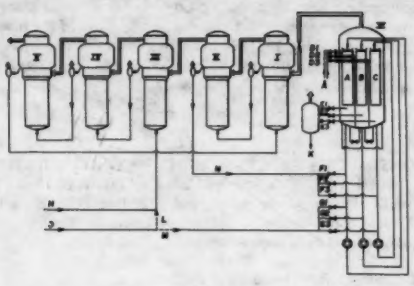
4,533,433
METHOD OF COVERING THE CHEMICAL LOSSES IN PULP PRODUCTION

Karl B. Pettersson, Gävle, Sweden, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

PCT No. PCT/SE83/00280, § 371 Date Mar. 8, 1984, § 102(e) Date Mar. 8, 1984, PCT Pub. No. WO84/00390, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 11, 1983, Ser. No. 598,307
Claims priority, application Sweden, Jul. 12, 1982, 8204266
Int. Cl.³ D21C *11/10*
U.S. Cl. 159—47.3 **3 Claims**

1. In the process of evaporation of a waste liquor from a pulping process to recover useful chemicals wherein the dilute waste liquor is evaporated in a plurality of evaporation stages to obtain thick waste liquor, and concentrated in a thickener, the thickener comprising at least two zones, a solution of a residual product from other processes is added to the waste liquor, said residual product being a member selected from the group consisting of (1) spent acid from a chlorine dioxide production plant and (2) spent acid from a tall oil plant, wherein during operation, at least one zone of said thickener is washed with thick waste liquor from a preceding evaporation

stage, the improvement which comprises introducing said residual product to a zone of said thickener which is not being



washed with thick waste liquor from a preceding evaporation stage.

4,533,434

PROCESS FOR SIZING PAPER AND PROCESS FOR MAKING PLASTERBOARD BASE PAPER SIZED THEREBY

Shigehiko Yoshioka; Hideto Yamada; Kimihiko Goto; Yoshio Adachi, and Kazuo Miyahana, all of hyogo, Japan, assignors to Seiko Kagaku Kogyo Co., Ltd., Japan

Filed Sep. 7, 1982, Ser. No. 415,585

Claims priority, application Japan, Sep. 11, 1981, 56-143318; Sep. 11, 1981, 56-143320

Int. Cl.³ D21H *1/02*

U.S. Cl. 162—124 14 Claims

1. A process for sizing paper comprising:

(o) forming an aqueous solution of ampholytic acrylamide polymer having both a cationic group and an anionic group,

(i) feeding into a mixer continuously and at a constant metered rate (a) said aqueous solution of an ampholytic acrylamide polymer defining a dispersing agent and having about 2–80 mol.% cationic and about 3–20 mol.% anionic groups, (b) a liquid substituted succinic anhydride; and

(ii) adding said aqueous dispersion into a papermaking pulp slurry continuously and at a constant metered rate immediately after said dispersion is prepared in said mixer.

14. A process for making plasterboard base paper sheets of multilayered structure comprising sheeting together at least one sized wet web and at least one unsized wet web said unsized wet web being formed from an unsized papermaking material and said sized wet web being formed from a sized papermaking material, wherein said sized papermaking material is prepared by;

(o) forming an aqueous solution of ampholytic acrylamide polymer having both a cationic group and an anionic group,

(i) feeding into a mixer continuously and at a constant metered rate (a) said aqueous solution of an ampholytic acrylamide polymer having about 2–80 mol.% cationic and about 3–20 mol.% anionic groups to form a dispersing agent, (b) a liquid substituted succinic anhydride and an oil-in-water type surfactant and,

(ii) adding said aqueous dispersion into a papermaking pulp slurry continuously and at a constant metered rate immediately after said dispersion is prepared in said mixer.

4,533,435

ANTIMICROBIAL PAPER

Henry S. Intili, Lewisville, N.C., assignor to Microban Products Company, Winston-Salem, N.C.

Filed Jun. 7, 1984, Ser. No. 618,084

Int. Cl.³ D21D *3/00;* D21H *5/22*

U.S. Cl. 162—161 6 Claims

1. An antimicrobial paper for packaging surgical supplies and other goods to be maintained in a sterile condition, said paper comprising:

(a) a slurry of paper forming fibers prepared according to a wetlaid process;

(b) a polymeric binding agent incorporated in said slurry, said binding agent being selected from the group containing acrylics, polyvinyl acetates, vinyl acetate-ethylenes, polyvinyl chlorides, and styrene-butadine latexes;

(c) an antimicrobial additive incorporated in said binding agent, said antimicrobial additive being non-crosslinked with said binding agent and forming reservoirs which reside in colloidal suspension within the amorphous zones of said binding agent and from which said antimicrobial additive migrates to the surface of said paper until the reservoir is exhausted;

(d) fillers selected from the group including aluminum silicates, titanium dioxide, calcium carbonates, zinc oxides, zinc sulfides, hydrated aluminum talc, calcium sulfate, and barium sulfate;

(e) said slurry, binding agents, additives and fillers being subjected to a paper-making process which renders a finished product having the characteristics of substantial density, air impermeability, and smoothness.

4. An antimicrobial paper for packaging surgical supplies and other goods to be maintained in a sterile condition, said paper comprising the combination of:

(a) paper forming fibers;

(b) a polymeric binding agent selected from the group containing acrylics, polyvinyl acetates, vinyl acetate-ethylenes, polyvinyl chlorides, and styrene-butadine latexes;

(c) said binding agent including an antimicrobial additive incorporated therein, said antimicrobial additive being non-crosslinked with said binding agent and forming reservoirs which reside in colloidal suspension within the amorphous zones of said binding agent and from which said antimicrobial additive migrates to the surface of said paper until the reservoir is exhausted;

(d) fillers selected from the group including aluminum silicates, titanium dioxide, calcium carbonates, zinc oxides, zinc sulfides, hydrated aluminum talc, calcium sulfate, and barium sulfate;

(e) said combination having the characteristics of substantial density, air impermeability, and smoothness.

4,533,436

APPARATUS FOR BLOW LINE ADDITION OF THERMOSETTABLE BINDER IN FIBERBOARD MANUFACTURE INCLUDING A COOLING NOZZLE

William E. Betzner, St. Petersburg, and Richard K. Holtman, Largo, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

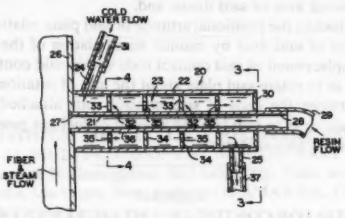
Division of Ser. No. 371,895, Apr. 26, 1983, Pat. No. 4,402,896. This application Aug. 15, 1983, Ser. No. 523,229

Int. Cl.³ D04H *3/16;* D21C *1/14*

U.S. Cl. 162—261 6 Claims

1. In an apparatus for refining cellulosic material including a pressurized refiner wherein said cellulosic material is subjected to the action of steam under pressure and refined to hot and wet fibers, and a blow line communicating with said refiner for discharge therefrom of said fibers, the improvement comprising an inner tube having resin inlet and outlet ends, said resin inlet end being connected to a resin feed line and said resin outlet end being connected to said blow line, and a housing disposed about said inner tube to define an enclosed jacketed area about said inner tube, said housing having at least one

cooling fluid inlet means adjacent the one end of said housing located to the exterior of said resin outlet end of said inner tube, said at least one cooling fluid inlet means being connected to a cooling fluid feed line, and at least one cooling fluid outlet



means adjacent the other end of said housing located to the exterior of said resin inlet end of said inner tube, said at least one cooling fluid outlet means being connected to a cooling fluid discharge line.

4,533,437

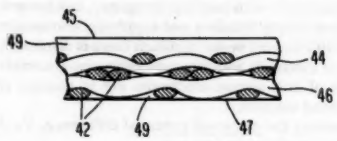
PAPERMAKING MACHINE

John F. Curran, West Chester, and Thomas N. Kershaw, Wallingford, both of Pa., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Nov. 16, 1982, Ser. No. 442,059

Int. Cl.³ D21F *3/00*

U.S. Cl. 162—281 **30 Claims**



1. In a papermaking machine of the type wherein a web of lingnocellulosic fibers is formed, and wherein the formed web is transferred to a dewatering and imprinting felt, said felt and web then passing through a nip formed by a pressure roll and a drying cylinder so as to deposit the web on the drying cylinder, said web having a dryness level between 7 percent and 35 percent as it enters said nip, wherein the felt in the papermaking machine is characterized by having imprinting yarn strands forming knuckles adjacent to the web contacting surface of the felt, the imprinting yarn strands having a spacing of about 6 to about 25 per 0.0254 meters but not significantly exceeding the average fiber length, the felt having a felt facing material greater than about 153 grams per square meter, and the felt having a ratio of felt facing material in grams per square meter to the diameter in meters of the imprinting yarn strands of from about 60,000 to about 600,000 whereby the web is differentially pressed onto the dryer surface.

4,533,438

METHOD OF PYROLYZING BROWN COAL

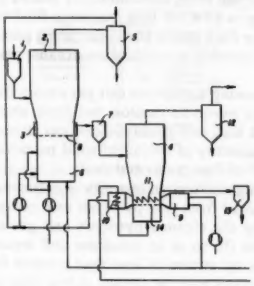
Wolfgang Michel, Magdeburg; Heinz Paul, Möser; Andreas Rummel, Dessau; Gero Seher, Wernigerode; Manfred Ossowski, Magdeburg, and Irmtrud Heberlein, Möser, all of German Democratic Rep., assignors to VEB Schwermaschinenbau "Karl Liebknecht" Magdeburg, Magdeburg, German Democratic Rep.

Filed Dec. 16, 1983, Ser. No. 562,504

Claims priority, application German Democratic Rep., Mar. 23, 1983, 249079

Int. Cl.³ C10B *49/10*

U.S. Cl. 201—31 **15 Claims**



1. A two stage method for the rapid pyrolysis of brown coal, said brown coal being rich in ash and saliferous, so as to simultaneously produce high grade coke, a rich pyrolysis exit gas stream of low dust content, and a pyrolysis tar stream of low dust content, which comprises

(a) providing a feed stream of solid particulate mined brown coal, said brown coal being rich in ash and saliferous;

(b) fluidizing and drying said brown coal feed stream in a first fluidized bed stage, by passing said brown coal feed stream into said first fluidized bed and above a first foraminous initial flow bottom support disposed below said first fluidized bed, said first fluidized bed and said first support being within a first container comprising a dryer means;

(c) burning a flammable gas stream with an air stream within a mixing chamber within said first container dryer means and below said first support, and concomitantly passing a recycle drying vapor gas stream and a combustion exhaust gas stream into said mixing chamber, so that hot mixed gas rises from said mixing chamber and through said first support, and fluidizes and heats said brown coal feed stream within said first fluidized bed, whereby said brown coal feed stream is dried in said first fluidized bed and within said first container dryer means by direct heating, with a limited degree of oxidation of the brown coal taking place in said first fluidized bed;

(d) withdrawing a drying vapor gas mixture stream from said first container dryer means, and from above said first fluidized bed, said drying vapor gas mixture stream containing a first quantity of entrained solid particulate material in the form of fine grains and dust;

(e) separating said first quantity of entrained solid particulate material from said drying vapor gas mixture stream;

(f) dividing the drying vapor gas stream derived from step (e) into two portions, a first portion being said recycle drying vapor gas stream of step (c), and a second portion being a discharged-off gas;

(g) withdrawing a dried coal stream from said first container dryer means, and from said first fluidized bed;

(h) carbonizing the withdrawn dried coal stream of (g) by rapid pyrolysis, and in a second fluidized bed stage, by passing said dried coal stream into said second fluidized bed and above a second foraminous initial flow bottom support disposed below said second fluidized bed, said

second fluidized bed and said second support being within a second container comprising a pyrolysis reactor;

(i) providing a hot gas stream containing hydrocarbon and alien to carbonization, and comprising a fluidizing medium, said hot hydrocarbon-containing gas stream being at a temperature corresponding to the pyrolysis conditions in said second container pyrolysis reactor of (h);

(j) passing said hot hydrocarbon-containing gas stream of (i) into said second container pyrolysis reactor below said second support, whereby said hot hydrocarbon-containing gas stream rises through said second support, and fluidizes and carbonizes said dried coal stream in said second fluidized bed, acting as a fluidizing medium and by rapid pyrolysis of said dried coal stream, said second fluidized bed being concomitantly heated by indirect heat exchange with a hot heat exchange fluid stream, the heat exchange fluid stream thereafter being passed into the said mixing chamber as combustion exhaust gas stream of step (c);

(k) withdrawing a pyrolysis exit gas stream from said second container pyrolysis reactor, and from above said second fluidized bed, said pyrolysis exit gas stream containing a second quantity of entrained solid particulate material in the form of fine grains and dust;

(l) separating said second quantity of entrained solid particulate material from said pyrolysis exit gas stream;

(m) cooling the cleaned pyrolysis exit gas stream derived from step (l), so as to condense and separate a product pyrolysis tar stream of low dust content from a product rich pyrolysis exit gas stream of low dust content; and

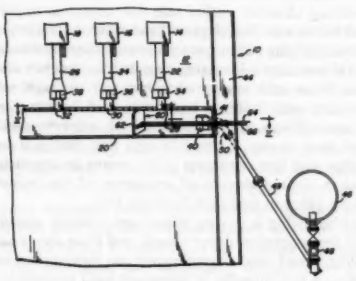
(n) withdrawing a product coke stream from said second container pyrolysis reactor, and from said second fluidized bed.

4,533,439

APPARATUS AND METHOD OF USING A FUEL GAS REGULATOR FOR A COKE OVEN BATTERY

Douglas M. Dickerson, Pleasant Grove, and Robert W. Fikes, Cottondale Township, Tuscaloosa County, both of Ala., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed May 27, 1983, Ser. No. 499,071
Int. Cl.³ C10B *21/10*
U.S. Cl. 201—41 **8 Claims**



1. A method for regulating the flow of fuel gas within the fuel gas supply duct for a coke oven heating wall having a plurality of vertical heating flues in communication with said fuel gas supply duct, said fuel gas supply duct having a passage therethrough of a predetermined cross-sectional shape, which duct is provided with an opening in the end thereof, from a position remote from said duct, which comprises:

a. inserting into said fuel gas supply duct a plate formed of heat-resistant sheet material, the shape of said plate being substantially that of the cross-sectional shape of said plate having at least two elongated control rods connected thereto, said control rods each extending from said remote position through said opening and having one of their ends pivotally attached to said plate at spaced points thereon;

b. adjusting the longitudinal position of said plate within said fuel gas supply duct by manual manipulation of said control rods so as to direct the flow of said fuel gas to a desired area of said ducts; and,

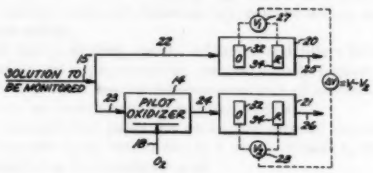
c. adjusting the positional attitude of said plate relative to the wall of said duct by manual manipulation of the relative displacement of said control rods within said control duct so as to rotate said plate about the axis of rotation formed between the ends of said control rods attached to said plate so as to regulate the amount of fuel gas passing said plate within said duct.

4,533,440

METHOD FOR CONTINUOUS MEASUREMENT OF THE SULFITE/SULFATE RATIO

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,389
Int. Cl.³ G01N *27/52*
U.S. Cl. 204—1 T **11 Claims**



1. A method to monitor the ratio of sulfite ion species concentration to sulfate ion species concentration and the rate of change thereof in a solution containing said species, said method comprising the steps of:

supplying at least a portion of said solution containing said sulfite and said sulfate ion species to a vessel in which there is disposed a redox electrode and a reference electrode so that both said electrodes are in contact with said solution;

determining the electrical potential difference, V_1, between said electrodes;

simultaneously with said supplying step, oxidizing a portion of said supply solution and supplying said oxidized solution to a second vessel in which there is disposed a second redox electrode and a second reference electrode so that both of said second electrodes are in contact with said oxidized solution;

determining the electrical potential difference, V_2, between said second electrodes; and

determining the difference between V_1 and V_2.

4,533,441

PRACTICAL AMORPHOUS IRON ELECTROFORM AND METHOD FOR ACHIEVING SAME

Rodger L. Gamblin, Dayton, Ohio, assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 30, 1984, Ser. No. 595,449
Int. Cl.³ C25D *1/00, 3/56*
U.S. Cl. 204—3 **12 Claims**

1. A method of fabricating amorphous iron-phosphorus electroforms, comprising electroforming on a conductive substrate in a bath containing:

at least one compound from which iron can be electrolytically deposited,

at least one compound from which phosphorus can be electrolytically deposited, selected from the group consisting of hypophosphorous acid and alkali metal hypophosphite

salts in an amount sufficient to render said iron amorphous, and

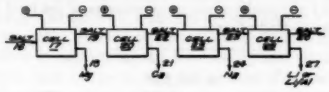
at least one complexing agent selected from the group consisting of glycine, β-alanine, DL-alanine and succinic acid.

4,533,442

LITHIUM METAL/ALLOY RECOVERY FROM MULTI-COMPONENT MOLTEN SALT

Ramaswami Neelameggham, Salt Lake City, Utah, and John C. Priscu, Las Vegas, Nev., assignors to AMAX Inc., Greenwich, Conn.

Filed Jul. 31, 1984, Ser. No. 636,439
Int. Cl.³ C25C *3/02, 3/04, 3/36*
U.S. Cl. 204—68 **5 Claims**



1. An electrolytic process for the recovery of lithium values from a multi-component molten salt composition containing $MgCl_2$, $CaCl_2$, NaCl, KCl and LiCl which comprises,

establishing an electrolyte bath of said composition in a cell having an anode and a cathode,

passing an electric current through said electrolyte in said cell at a current density and voltage selective to the production of magnesium,

separating the magnesium in said cell from the salt composition remaining in said cell,

electrolyzing the remaining salt composition at a current density and voltage selective to produce a product of sodium/calcium at the cathode thereof,

separating said sodium/calcium product from the remaining salt composition in said cell containing $CaCl_2$, KCl and LiCl,

electrolyzing said remaining salt composition at a current density and voltage selective to the further removal of calcium and thereby leave a salt composition of KCl-LiCl which is thereafter subjected to the further treatment thereof by electrolysis to recover lithium.

4,533,443

PRODUCTION OF HYDROGEN PEROXIDE

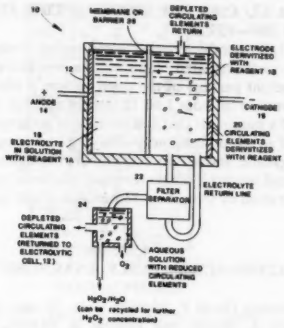
Mark S. Wrighton, Winchester, Mass.; Robert M. Buchanan, Louisville, Ky., and Gary S. Calabrese, Reading, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 19, 1983, Ser. No. 543,574
Int. Cl.³ C25B *1/30*
U.S. Cl. 204—84 **8 Claims**

1. A method for producing hydrogen peroxide employing an electrolytic cell comprising a chamber filled with an electrolyte solution, an anode, a cathode, and means for generating a current between the anode and cathode, the method comprising

(a) reducing at least one element, the element situated in the electrolyte solution and carrying a surface-derivatized quinone catalyst, by generating a current between the anode and cathode in said electrolytic cell;

(b) separating the element from the electrolyte solution; and


MEMBRANE OR BARRIER 26
DEPLETED CIRCULATING ELEMENTS RETURN
ELECTRODE DERIVITIZED WITH REAGENT 1B
ANODE 14
CATHODE 16
ELECTROLYTE IN SOLUTION WITH REAGENT 1A
CIRCULATING ELEMENTS DERIVITIZED WITH REAGENT 1B
FILTER SEPARATOR
ELECTROLYTE RETURN LINE
DEPLETED CIRCULATING ELEMENTS (RETURNED TO ELECTROLYTIC CELL 12)
AQUEOUS SOLUTION WITH REDUCED CIRCULATING ELEMENTS

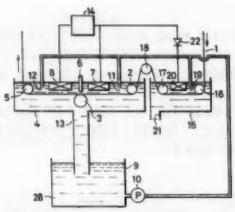
(c) transferring the element to an oxygenated aqueous environment to cause the reduction of oxygen to hydrogen peroxide.

4,533,444

METHOD OF ELECTROLYTIC TREATMENT ON THE SURFACE OF METAL WEB

Kazutaka Oda; Hisao Ohba; Teruo Miyashita; Akira Morita, and Masahiro Takahashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd. and Nippon Light Metal Company Ltd., both of, Japan

Filed May 17, 1984, Ser. No. 611,288
Claims priority, application Japan, May 19, 1983, 58-86619
Int. Cl.³ C25F *3/02, 3/04, 7/00*
U.S. Cl. 204—129.43 **7 Claims**



1. A method of electrolytic treatment on the surface of metal web employing graphite electrodes and in which an A.C. having asymmetric positive and negative half cycles is applied between ones of said electrodes to continuously apply an electrolytic treatment to a metal web through an electrolytic solution, the improvement wherein a portion of the current of the one of said half cycles having the larger average value over a complete cycle of said A.C. current is applied to an auxiliary anode electrode provided in addition to said graphite electrodes so that a current density for anode reaction on surfaces of said graphite electrodes is smaller than a current density for a cathode reaction on surfaces of said graphite electrodes.

4,533,445
U.V. CURABLE COMPOSITION

Alfred P. Orio, Derry, N.H., assignor to Shipley Company Inc., Newton, Mass.

Filed Jul. 6, 1983, Ser. No. 511,224
Int. Cl.³ C08J *3/28;* **C08G** *2/02;* **C08L** *33/08, 33/10*
U.S. Cl. 204—159.19 **32 Claims**

1. A.U.V. curable coating composition comprising an acrylated or methacrylated oligomer in a concentration of from 30 to 70 weight percent of the composition, a photoinitiator in a concentration of from 1 to 12 weight percent of the composition and a monomer that is a mixture of an acrylate or methacrylate of an alkoxylated polyol having an average functionality of 2 or greater and a monofunctional ethylenically unsaturated compound having a single terminal ethylenic group, each in a concentration of from 5 to 35 percent of the composition.

4,533,446
RADIATION-ACTIVATABLE ANAEROBIC ADHESIVE COMPOSITION

Paul Conway; David P. Melody; John Woods; J. Eisirt Casey; Bernard J. Bolger, and Francis R. Martin, all of Dublin, Ireland, assignors to Loctite (Ireland) Ltd., Dublin, Ireland

Filed Jul. 20, 1983, Ser. No. 515,540
Int. Cl.³ C08F *2/50;* **B05D** *3/06*
U.S. Cl. 204—159.24 **23 Claims**

1. A radiation activatable anaerobic adhesive composition comprised of

(a) an anaerobically curable acrylate ester monomer,

(b) a compound which decomposes upon exposure to ultraviolet or visible light radiation to release a strong acid, said compound having the formula $[A]_d^+[MX_e]^{-(e-f)}$ where A is a cation selected from the group consisting of iodonium and sulfonium cations, M is a metal or metalloid, X is a halogen radical, d=e-f, f=the valence of M and is an integer equal to 2 to 7, inclusive, e is greater than f and is an integer having a value up to 8,

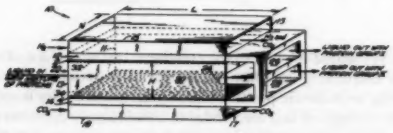
(c) a peroxy free radical initiator capable of initiating the polymerization of the monomer in the substantial absence of oxygen, and

(d) an activator of anaerobic polymerization which in the presence of a strong acid reacts with the peroxide initiator to produce free radicals to catalyze the anaerobic polymerization of the monomer, said activator selected from ferrocenyl compounds having the formula $R^1C_5H_4$—$FeC_5H_4R^2$ where R^1 and R^2 are selected from —H, —COOH, —$CO.CH_3$, $CO.\phi$, n-alkyl and vinyl.

4,533,447
APPARATUS FOR AND METHOD OF ISOELECTRIC FOCUSSING

Jerry H. Meldon, 4 Greenway Ct., Apt. 3, Brookline, Mass. 02146

Filed Jun. 13, 1983, Ser. No. 503,916
Int. Cl.³ B01D *17/06;* **G01N** *27/26, 27/28*
U.S. Cl. 204—181.4 **29 Claims**



20. A method of separating a feed stream comprising a mixture of proteins of different isoelectric points into one or more concentrated feed streams composed of proteins of defined isoelectric fractions, which method comprises:

(a) flowing an aqueous feed stream along a narrow channel flow path established between a first carbon dioxide-permeable membrane and a second carbon-dioxide-permeable membrane, each of said membranes having an inner surface facing said flow path and an outer surface facing a gas;

(b) flowing a carbon-dioxide-containing gas stream adjacent the outer surface of the first membrane;

(c) flowing an inert sweep gas adjacent the outer surface of the second membrane;

(d) diffusing and passing the carbon-dioxide-containing gas through the first carbon-dioxide-permeable membrane in a direction generally transversely to the narrow channel flow path of the feed stream and through the second carbon-dioxide-permeable membrane, to establish a concentration gradient in the dissolved carbon-dioxide gas stream across the narrow channel flow path of the feed stream, and to provide a pH gradient across the narrow channel flow path;

(e) withdrawing a mixture of the carbon-dioxide-containing-gas stream and the inert sweep gas stream from a location adjacent the second membrane; and

(f) recovering, after a period of time, concentrated feed streams composed of proteins of defined isoelectric fractions, by physically separating portions of the feed stream after the period of time.

4,533,448
AMINE-FREE AND SURFACTANT-FREE ELECTRODEPOSITION OF POLYESTERS, POLYAMIC ACIDS, POLYIMIDES, AND POLYAMIDE-IMIDES

Luciano C. Scala, Murrysville; William M. Alvino, Penn Hills, and Timothy J. Fuller, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1982, Ser. No. 350,499
Int. Cl.³ C08K *5/07*
U.S. Cl. 204—181.7 **7 Claims**

1. A method of electrodepositing polyamic acids on a workpiece comprising

(A) preparing an emulsion which comprises

(1) a soluble un-ionized polymer containing a linking group selected from the group consisting of amic acid, amide, imide, and mixtures thereof;

(2) a non-electrolyzable organic solvent for said polymer which forms the discontinuous phase of said emulsion; and

(3) a non-electrolyzable organic non-solvent for said polymer which forms the continuous phase of said emulsion, where the weight ratio of said solvent to said non-solvent is about 0.1 to about 0.5, and said polymer is about 0.4 to about 5% by weight of the weight of said solvent;

(B) placing said workpiece into said emulsion about one-half to about two inches away from a cathode;

(C) passing direct current between said cathode and said workpiece, with said workpiece as the anode, until a coating of the desired thickness has been deposited onto said workpiece;

(D) removing said workpiece from said composition;

(E) drying said coating; and

(F) curing said coating.

4,533,449
RAPID SURFACE FIGURING BY SELECTIVE DEPOSITION

Harold Levenstein, Danbury, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 16, 1984, Ser. No. 600,760
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **4 Claims**

1. An apparatus for figuring an optical surface, comprising:

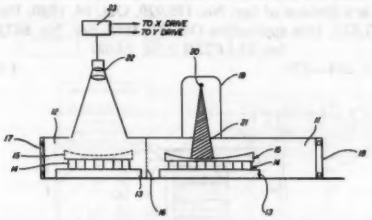
a platform for supporting an optical element whose surface is to be figured,

a material deposition source comprising a circular magnetron disposed adjacent said platform and adapted to be moved relative thereto,

a vacuum chamber enclosing said source and platform,

means for moving said platform relative to said source to vary the amount of material deposited onto said surface in accordance with a predetermined surface figure,

interferometer means for measuring the figure of said surface,



computer means connected to said interferometer means and storing a model of the desired surface figure,

said computer means comparing the measured and stored surface to provide signals for moving said platform relative to said source to vary the amount of material deposited on said surface in accordance with the stored model.

4,533,450

CONTROL OF THE HYDROGEN BONDING IN REACTIVELY SPUTTERED AMORPHOUS SILICON

Theodore D. Moustakas, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 514,195, Jul. 15, 1983, abandoned, which is a continuation of Ser. No. 213,034, Dec. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 108,469, Dec. 31, 1979, abandoned. This application Sep. 6, 1984, Ser. No. 648,012

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 S **9 Claims**

1. A method for controlling the silicon to hydrogen bonding in sputtered amorphous silicon comprising reactively sputtering a layer of amorphous silicon in a partial pressure of hydrogen and argon while concurrently applying a predetermined positive DC voltage bias to the sputtered film to produce controlled monohydride and polyhydride bond density in sputtered amorphous silicon films, wherein a positive DC voltage bias is applied to the film to decrease the polyhydride bond density of said film.

4,533,451

ELECTROLYZED WATER PRODUCING APPARATUS

Eiji Kumazawa, Tokyo, Japan, assignor to Kabushiki Kaisha Kogai Boshi Sogo Kenkyusho, Tokyo, Japan

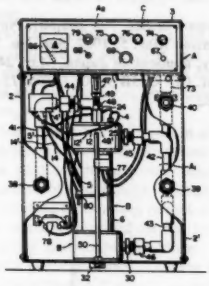
Filed May 30, 1984, Ser. No. 615,437

Claims priority, application Japan, Jun. 9, 1983, 58-103666

Int. Cl.³ C25B *15/02, 9/00, 11/04*

U.S. Cl. 204—229 **2 Claims**

1. An electrolyzed water producing apparatus comprising a casing; at least one electrolytic cell arranged in said casing comprising a cylindrical cathode and a cylindrical anode arranged concentrically to each other, a partition arranged between said cathode and said anode, and upper and lower caps respectively secured to upper and lower open ends of said cathode and said anode; and an electric control device, arranged in said casing comprising an automatic-manual operation changing circuit for changing said apparatus between automatic and manual operating modes, an electric current adjusting circuit for adjusting electrolytic current dependent upon variation in water quality, and a slow start circuit for delaying the supply of electrolytic current to said at least one electrolytic cell until after water has been supplied to said at least one electrolytic cell when commencing the electrolyzing



operation of said apparatus in the automatic operating mode thereof.

4,533,452

ELECTROLYSIS TANK, FOR THE PRODUCTION OF ALUMINUM, HAVING A FLOATING CONDUCTIVE SCREEN

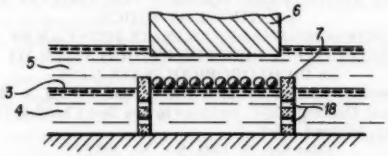
Michel Leroy, and Maurice Keinborg, both of Saint Jean de Maurienne, France, assignors to Aluminium Pechiney, Paris, France

Filed Jun. 30, 1983, Ser. No. 509,585

Claims priority, application France, Jun. 30, 1982, 82 11873

Int. Cl.³ C25C *3/08;* **C25B** *11/03, 11/04*

U.S. Cl. 204—243 R **2 Claims**



1. An electrolysis tank for producing aluminum by electrolysis of alumina dissolved in a bath of molten cryolyte between at least one superior carbonaceous anode and a pool of molten aluminum covering an inferior carbonaceous cathodic substrate, said tank comprising, at the interface of the pool of molten aluminum and the bath of molten cryolyte:

a floating screen conductive to electric current wherein said screen comprises a single layer of regularly shaped conductive elements wherein said screen is limited to the space below said anode and wherein said conductive elements comprise porous TiB_2 having an average density between 2.2 and 2.25 and wherein said screen further comprises an external layer of TiB_2 having a thickness of at least 20 micrometers in order to make the surface of said screen superficially fluid tight.

4,533,453

ION EXCHANGE MEMBRANE ELECTROLYTIC CELL

Yoshio Oda; Takeshi Morimoto, and Kohji Suzuki, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 205,567, Nov. 10, 1980,. This application Mar. 5, 1982, Ser. No. 355,313
Claims priority, application Japan, Mar. 24, 1981, 56-41789
Int. Cl.³ C25B *9/00, 11/06, 13/08*
U.S. Cl. 204—252 13 Claims

1. In an ion exchange membrane electrolytic cell which comprises an anode, a cathode, an anode compartment and a cathode compartment partitioned by an ion exchange membrane, the improvement comprising:

the surface of said ion exchange membrane on the cathode side of said cell having bonded thereto a gas and liquid permeable porous layer composed of non-oxide ceramic particles, said particle layer not functioning as an electrode of said cell.

4,533,454

ELECTROLYTIC CELL COMPRISING STAINLESS STEEL ANODE, BASIC AQUEOUS ELECTROLYTE AND A CATHODE AT WHICH TETRACHLORO-2-PICOLINATE IONS CAN BE SELECTIVELY REDUCED IN HIGH YIELD TO 3,6-DICHLOROPICOLINATE IONS

Demetrios Kyriacou, Salonica, Greece, and Donald N. Brattesani, Oakland, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 28, 1981, Ser. No. 305,822
Int. Cl.³ C25B *11/00, 3/00*
U.S. Cl. 204—272 4 Claims

1. An electrolytic cell comprising

(a) a stainless steel anode, and

(b) a silver cathode having a surface layer of silver microcrystals formed by electrolytic reduction of colloidal, hydrous silver oxide particles in the presence of an aqueous base and being capable of effecting the selective reduction of tetrachloro-2-picolinate anions to 3,6-dichloro-2-picolinate anions in a yield of at least 90% when said cathode is employed in conjunction with a graphite anode in an electrolytic cell containing a basic, aqueous electrolyte in which said tetrachloropicolinate is dissolved.

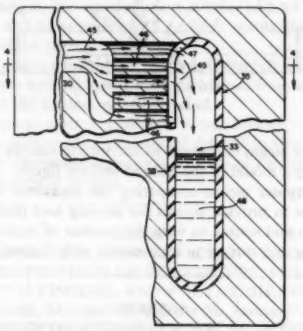
2. The cell of claim 1 in which said anode and cathode are of a cylindrical configuration and one is disposed concentrically within the other.

4,533,455

BIPOLAR SEPARATOR PLATE FOR ELECTROCHEMICAL CELLS

Edward N. Balko, Wilmington, Mass., and Lawrence C. Moulthrop, Stratham, N.H., assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Division of Ser. No. 516,165, Jul. 20, 1983, abandoned, which is a continuation of Ser. No. 365,205, Apr. 5, 1982, abandoned, which is a division of Ser. No. 195,920, Oct. 14, 1980, Pat. No. 4,371,433. This application Oct. 31, 1984, Ser. No. 667,053
Int. Cl.³ C25B *9/04, 13/00*
U.S. Cl. 204—279 1 Claim



1. Bipolar separator plate of substantially rectangular shape for vertical filter press diaphragm-type electrolysis cells having a plurality of projections extending from a recessed surface on the central portion of both sides of the plate, said projections defining a plurality of fluid distributing channels and conducting electric current to electrodes in contact with the peaks of said projections, outlet manifold means in the form of holes normal to the plane of the plate in both non-recessed perimetral vertically extending portions of the plate, one of said manifold means communicating with the recessed central portion on one side of the plate and the other manifold means communicating with the recessed central portion on the opposite side of the plate through at least one conduit in the non-recessed vertical portions of the plate, the said conduits communicating with the upper portions of said manifold means which extend vertically down the height of the plate to hold the level of a pool of discharging liquid below the level of said conduits, the surfaces of said conduits and of said manifold means being of electrically non-conductive material.

4,533,456

OXYGEN SENSOR FOR RAPID BLOOD GAS ANALYSIS

Jiri Kratochvil, Sandy, and Jiri Janata, Salt Lake City, both of Utah, assignors to Critikon, Tampa, Fla.

Filed Apr. 5, 1984, Ser. No. 597,001
Int. Cl.³ G01N *27/46*
U.S. Cl. 204—415 3 Claims

1. In a system for analysis of partial pressures of gases in blood, an oxygen sensor comprising:

(a) an oxygen permeable membrane to which blood samples are periodically exposed for a predetermined time period;

(b) an electroylte acceptor for oxygen which passes through said membrane;

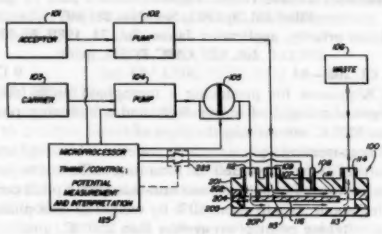
(c) an anode electrode and a cathode electrode, which both are immersed in said electroyte; and the improvement which comprises

(d) means for substantially replacing the electrolyte in said sensor prior to each presentation of respective samples to the other side of said membrane;

(e) control means automatically operating a switch means for establishing an open circuit condition between said

electrodes during replacement of said electrolyte and during and for a first predetermined time after presentation of each of said samples, and for polarizing said electrodes at a predetermined voltage for a second predetermined time; and

(f) means for measuring current between said electodes at the end of said second predetermined time.



4,533,457

ION SELECTIVE ELECTRODE DEVICE AND ION ANALYZING APPARATUS

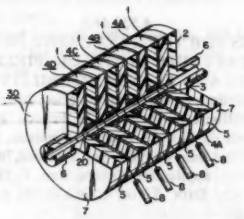
Fumio Watanabe, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 17, 1983, Ser. No. 524,074

Claims priority, application Japan, Aug. 28, 1982, 57-149774

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—411 **2 Claims**



2. An apparatus for measuring the ion concentration of a solution, comprising:

reference electrode means for producing a first electrical potential, said reference electrode means including:

means for thermally insulating said solution, said thermal insulating means including means for defining a first aperture;

first ion sensitive layer means, disposed on the periphery of said first aperture, for producing said first electrical potential; and

first electrical conducting means, disposed on said thermal insulating means in contact with said first layer means, for conducting said first electrical potential;

at least one ion selective electrode means for producing a second electrical potential, said ion selective electrode means including:

means for thermally insulating said solution, said thermal insulating means including means for defining a second aperture;

second ion sensitive layer means, disposed on the periphery of said second aperture, for producing said second electrical potential; and

second electrical conducting means, disposed on said thermal insulating means in contact with said second layer means, for conducting said second electrical potential;

means for attaching said reference electrode means and said ion selective electrode means together in a stack such that said first and second apertures are in registry;

means, coupled to said first and second apertures, for inducing a flow of said solution through said first and second apertures; and

means, connected to receive said first and second electrical potentials conducted by said first and second electrical conducting means, for converting the difference between said first and second electrical potentials to indicia of ion concentration, wherein:

said thermal insulating means of said ion selective electrode means comprises a disk having first and second opposing flat surfaces, said second aperture being defined in the substantial center of and axially through said disk; and

said second electrical conducting means comprises:

a first annular portion disposed on the first surface of said disk surrounding said second aperture;

a second annular portion disposed on the second surface of said disk surrounding said second aperture;

a third annular portion, disposed within said second aperture on the inner peripheral surface of said disk defining said second aperture, said third portion electrically connecting said first and second annular portions, and second ion sensitive layer means disposed on said third annular portion; and

terminal means, disposed on said first surface of said disk, for electrically connecting said first annular portion of said converting means.

4,533,458

REDOX CATALYST PLUS PROMOTER FOR OXIDATION OF HYDROCARBONS

Donald D. Carlos, Louisville, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 262,859, May 12, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 539,433

Int. Cl.³ C07C *53/00, 27/10*

U.S. Cl. 208—3 **2 Claims**

1. A process for oxidizing a liquid mixture of saturated hydrocarbons having an average number of carbon atoms per molecule of 25 to 50 and containing at least one of an oxidizing inhibitor and redox metal catalyst poison to an acid number of up to at least about 45 to 50 comprising blowing air at a rate of 3.5 to 4.0 liters per minute per liter of hydrocarbons through a liquid mass of said hydrocarbons containing at least one of an oxidation inhibitor and redox metal catalyst poison in the presence of 0.03 to 0.04 percent by weight of manganese provided by manganese carboxylate, based on weight of said liquid hydrocarbons; and

an oxidation promoting amount of calcium provided by water-lime slurry, the weight ratio of manganese to calcium being about 1:1 to 1:2;

the temperature of reaction being 160° C. to 165° C., the pressure being 150 to 250 psig and the reaction being carried out for about 2 hours or less, thereby providing an oxidized hydrocarbon mixture having an acid number of at least about 45 to 50.

4,533,459

EXTRACTION PROCESS

Mario Dente, Milan, Italy; Guiliano Porcari, Edmonton, Canada, and Lee F. Robinson, London, England, assignors to RTR Riotinto Til Holding S.A., Zug, Switzerland

Continuation of Ser. No. 299,306, Sep. 4, 1981, abandoned. This application Aug. 20, 1984, Ser. No. 642,383

Claims priority, application Italy, Sep. 17, 1980, 68438 A/80

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE **12 Claims**

1. A process for extracting bitumen oils from a raw material consisting essentially of oil sands and lumps of disintegrable material such as clay, the process including the steps of

(a) conditioning the raw material in a conditioner by intro-

ducing a stream of hot water with a water to raw material ratio of at least 1:1 by weight and by gently mixing the water and raw material without sufficient force to cause substantial disintegration of clay present in the raw material while promoting the release of bitumuen oils from the solids of said raw materials and forming within the conditioner of separate solids and liquid phases;

(b) moving said solids along said conditioner without maintaining them in suspension and discharging said solids phase from said conditioner separately from said liquid phase;

(c) separating said liquid phase into an oil-rich component and a middlings component containing essentially water and fines and with only minor proportions of oil and solids;

(d) removing at least a part of the fines from said middlings component by flocculation separation of said middlings component and contrifuging of the produced thickened solids, and thereby producing a fines discharge of relatively low liquid content and a liquid discharge;

(e) immediately recycling said liquid discharge while hot as at least a part of the hot water supplied for said conditioning; and

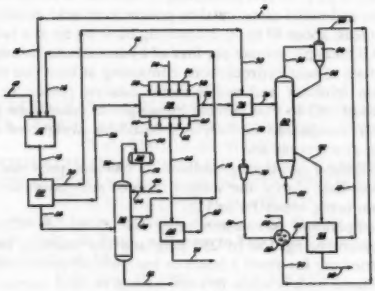
(f) delivering said oil-rich component for further treatment.

4,533,460

OIL SHALE EXTRACTION PROCESS

Phillman N. Ho, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 14, 1984, Ser. No. 651,045
Int. Cl.³ C10G *1/04*
U.S. Cl. 208—11 LE **26 Claims**



1. A process for recovering hydrocarbon liquids from solids containing organic material which comprises:

(a) passing a liquid organic solvent and a hot, nonoxidizing gas downwardly through an extraction zone in contact with said solids at an elevated pressure sufficient to maintain said solvent in the liquid phase and at a temperature below about 900° F. but sufficiently high such that hydrocarbons are extracted from said solids into said organic solvent;

(b) withdrawing said liquid organic solvent and said extracted hydrocarbons from the bottom of said extraction zone; and

(c) recovering said extracted hydrocarbons from said liquid organic solvent as said hydrocarbon liquids.

4,533,461

PROCESS FOR PRODUCING MESOPHASE PITCH

Takayuki Izumi; Tsutomu Naito, both of Saitama, and Seiko Igarashi, Sakado, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,407
Claims priority, application Japan, Jul. 21, 1980, 55-99646
Int. Cl.³ C10C *3/00*
U.S. Cl. 208—44 **9 Claims**

1. A process for producing a mesophase pitch having a mesophase content of above 90% and a softening point of below 320° C. comprising the steps of:

(1) heat-treating a pitch forming material at elevated temperatures above about 380° C. for a time sufficient to provide a mixture of mesophase and non-mesophase pitch containing about 20% to about 80% by weight of mesophase and a softening point of no greater than 250° C.;

(2) aging and settling said mesophase portion of said mixture of mesophase and non-mesophase pitch obtained in step (1) by maintaining the mixture in a substantially quiescent condition and at a temperature below the temperature in the heat-treating step and above about 350° C. for a time sufficient for the mesophase portion of the mixture to coalesce and accumulate into a substantially lower homogeneous mesophase pitch layer containing at least 90% mesophase and an upper layer comprising the non-mesophase portion of said mixture; and

(3) separating said lower mesophase layer from said upper non-mesophase layer whereby a mesophase pitch which has a mesophase content of above 90% and a softening point below 320° C. is obtained.

4,533,462

PROCESS FOR THE TREATMENT OF HIGHLY VISCOUS HEAVY OILS AT THE OIL FIELD TO EFFECT DESALTING AND TRANSPORTABILITY THEREOF

Alain Billon, Orliénas; Jean-Pierre Peries, Mornant, and Alain Quignard, Rillieux-La-Pape, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jan. 6, 1984, Ser. No. 568,761
Claims priority, application France, Jan. 7, 1983, 83 00304
Int. Cl.³ C10C *33/00*; C10G *45/00, 67/00*
U.S. Cl. 208—88 **11 Claims**

1. A process for the treatment, at the production field, of a highly viscous crude oil, containing salt and water, in order to convert it to an oil of lower viscosity and lower salt and water contents, said process comprising the steps of:

(a) diluting the crude oil with a hydrocarbon cut of low viscosity obtained in step (d), in such a proportion that the dynamic viscosity of the resultant mixture is 0.2–0.8 mPa.s at 150° C and its density is 0.68–0.82 g/ml at 150° C;

(b) subjecting the resultant diluted oil from step (a) to at least partial desalting and at least partial dehydration;

(c) subjecting the desalted and dehydrated oil diluted with said hydrocarbon cut of low viscosity from step (b) to hydrovisbreaking, in the presence of hydrogen, at a temperature of 420–490° C, a pressure of 40–200 bar, a total residence time from 10 seconds to 15 minutes in a reaction furnace and soaking chamber, and a ratio of the normalized volume of hydrogen to the volume of the desalted and dehydrated oil of 200–3,000; and converting 10 to 30% of the 380° C^+ fraction of the hydrovisbreaking charge to a 380° C^- fraction; and

(d) distilling the effluent from step (c), and separating a hydrocarbon cut having a kinematic viscosity below 400 cSt. at 37.8° C, at least 50% by weight of which normally distills between 100° and 380° C, feeding at least a portion thereof back to step (a), and combining the remaining liquid distillation effluents to form a synthetic crude oil of reduced viscosity and low salt and water contents.

4,533,463

CONTINUOUS COKING OF RESIDUAL OIL AND PRODUCTION OF GASEOUS FUEL AND SMOKELESS SOLID FUELS FROM COAL

Tsoung Y. Yan, Philadelphia, Pa., and Darrell D. Whitehurst, Titusville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,505
Int. Cl.³ C10G 9/28, 9/32
U.S. Cl. 208—127 8 Claims

1. A method of simultaneously processing residual oil and coal to produce liquid and solid smokeless fuel comprising:

burning devolatized coal or char in a combustion zone maintained at a temperature between 1400°–2000° F. in the bottom of a reactor maintained at a pressure in the range of 0–50 psig;

fluidizing char and coal with gas rising from said combustion zone;

injecting residual oil into heat exchange relationship with the top of the fluidized bed of char and coal;

recovering overhead effluent to produce said liquid fuel;

removing char from said fluidized bed to produce solid fuel; and

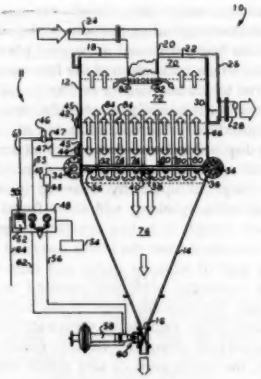
controlling the air fed to said combustion zone to an amount which generates the requisite heat for coking said residual oil, but limited to an amount required for partial gasification of 10–40% of said coal, substantial desulfurization of said coal, and production of said solid fuel.

4,533,464

TEETER BED ZONE DENSITY CONTROL DEVICE AND METHOD

Michael J. Smith, Granby, and Allen L. Soucie, Ellington, both of Conn., assignors to Linatex Corporation of America, Stafford Springs, Conn.

Filed May 25, 1983, Ser. No. 498,150
Int. Cl.³ B03B 5/66, 11/00
U.S. Cl. 209—158 6 Claims



1. A method of controlling the density of a teeter bed zone of a hindered-settling fluid classifier having an overflow zone wherein said teeter bed zone has upper and lower boundaries comprising the steps of:

selecting a desired value of average density of the teeter bed zone,

measuring the average particle density from the upper boundary of the teeter bed zone to the top of the overflow zone and from the lower boundary of the teeter bed zone to the top of the overflow zone,

comparing said measured average particle densities to obtain a differential therebetween, and

regulating the underflow discharge in proportion to the deviation of the differential of said measured average particle densities and said selected value to adjust the average density of the teeter bed zone to approximately said selected value.

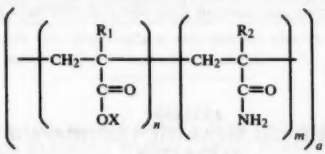
4,533,465

LOW MOLECULAR WEIGHT COPOLYMERS AS DEPRESSANTS IN SYLVINITE ORE FLOTATION

Richard M. Goodman, Norwalk, and Sim K. Lim, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 372,259, Apr. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 246,521, Mar. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 95,812, Nov. 19, 1979, Pat. No. 4,289,613. This application Jul. 16, 1984, Ser. No. 631,009
The portion of the term of this patent subsequent to Sep. 15, 1998, has been disclaimed.
Int. Cl.³ B03D 1/14
U.S. Cl. 209—167 8 Claims

1. A process for enhancing recovery of sylvite in a sylvinite ore flotation system including an amine collector, said process comprising adding to the flotation system, as a selective depressant, an effective amount of a copolymer or water soluble salts thereof of the general structure:



wherein R_1 and R_2 are individually hydrogen or a methyl radical, X is a hydrogen, alkali metal or ammonium ion, n and m are whole numbers such that the degree of hydrolysis is within the range from about 5% to 66% and n, m and a have numerical value such that the total molecular weight of copolymer is within the range from about 500 to 85,000.

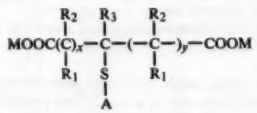
4,533,466

POLYCARBOXYLIC ACID DERIVATIVES AND USES

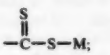
Clarence R. Bresson; Benjamin R. Robles, and Robert M. Parlman, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 480,206, Mar. 30, 1983, Pat. No. 4,482,480. This application Oct. 31, 1984, Ser. No. 666,865
Int. Cl.³ B03D 1/14
U.S. Cl. 209—167 11 Claims

1. A process for depressing sulfides of at least one of copper, iron and lead in a minerals containing mixture in a flotation operation, said process comprising carrying out a flotation with a depressant composition present, said depressant composition comprising a mercapto polycarboxylic acid or derivative represented by the formula:



where R_1 and R_2 are selected from the group consisting of hydrogen and an alkyl group having 1 to 3 carbon atoms and R_3 is selected from the group consisting of hydrogen, alkyl group having 1–3 carbon atoms and COOM,M is selected from the group consisting of hydrogen, ammonium, Li, Na, K, Rb and Cs, A is selected from the group consisting of M and



and where x and y are 0 or any integer from 1 through 7.

4,533,467

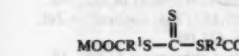
ORE FLOTATION AND FLOTATION AGENTS FOR USE THEREIN

Kenneth B. Kimble; Clarence R. Bresson, and Harold W. Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 10, 1984, Ser. No. 608,827
Int. Cl.[3] B03D *1/02*; C07C *153/00*; C22B *3/00*
U.S. Cl. 209—167 22 Claims

15. A process for recovering minerals comprising:

(a) mixing crushed ore containing minerals, water and a composition having the formula



$$MOOCR^1S-\overset{\overset{S}{\|}}{C}-SR^2COOM,$$

wherein M is selected from the group consisting of ammonium and alkali metals, R^1 is selected from the group consisting of alkylene radicals each radical having no more than 6 carbon atoms, R^2 is selected from the group consisting of alkylene radicals each radical having no more than 6 carbon atoms, and R^1 and R^2 can be the same or different, to establish a pulp;

(b) aerating said thus established pulp to produce a froth containing said minerals; and

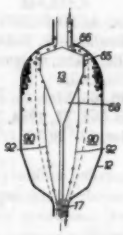
(c) recovering said minerals from said thus produced froth.

4,533,468

CENTRIFUGAL SEPARATION METHOD AND APPARATUS

Paul M. D. Ensor, Maida Vale, and Neville C. Bassett, Kensington, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Dec. 6, 1983, Ser. No. 558,463
Claims priority, application Australia, Dec. 6, 1982, PF7137
Int. Cl.[3] B04B *1/14*
U.S. Cl. 209—172 36 Claims



1. A method of separating lighter and heavier particles in a solids mixture, comprising:

entraining the mixture in a liquid of a specific gravity intermediate the specific gravities of the lighter and heavier particles;

feeding the liquid with entrained mixture through a first opening into one end of a vessel and revolving the liquid therein by rotating the vessel, the vessel being designed so that the liquid attains a dynamic equilibrium at which an annular, centrifugally induced, substantially static, revolving volume of the liquid of stable internal surface is confined by the vessel about the axis of revolution while further liquid flows on within said stable internal surface, whereby the heavier particles are centrifugally directed into said annular volume of the liquid while the lighter particles remain entrained in on-flowing liquid within said internal surface which flows out a second opening in the other end of the vessel; and

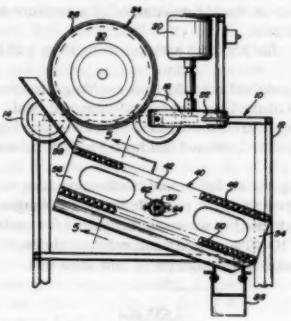
discontinuing feeding the mixture to the vessel, slowing and stopping the rotating vessel to release said annular volume of the liquid, which then, with the heavier particles entrained, swirls towards and flows through one of said openings.

4,533,469

GRASS SEED FROM STEM REMOVER

Victor A. Beisel, Rte. 1, Box 26, Fargo, Okla. 73840

Filed Jan. 6, 1984, Ser. No. 569,248
Int. Cl.[3] B07B *1/28*
U.S. Cl. 209—243 5 Claims



1. An apparatus for removing grass seeds from grass stalks and stems, said apparatus including an elongated, inclined sieve frame, said sieve frame including a plurality of sets of individual elongated transversely extending and transversely corrugated sheet metal sections with the sections of each set arranged in laterally spaced parallel relation in an inclined plane extending lengthwise of said sieve frame, each of said sections being substantially transversely straight throughout its transverse extent and corresponding portions of the corrugations of adjacent sections being disposed in parallel planes oppositely inclined relative to the inclination of the first-mentioned plane, means operative to vibrate said sieve frame, said sieve frame including at least three laterally spaced edge upstanding plates extending longitudinally thereof, each set of corresponding sections being disposed between one pair of adjacent plates and secured at their opposite ends to the corresponding plates, a plurality of elongated upwardly opening inclined troughs extending longitudinally along said sieve frame beneath the latter with each trough including opposite longitudinal marginal portions mounted from the lower marginal portions of a corresponding pair of adjacent plates and each set of corrugated sections registered with and disposed above a corresponding trough, the opposite sides of the upper and lower ends of said sieve frame each being supported from the lower ends of a plurality of elongated flexible elastic members, a support frame, the upper ends of said elastic members being anchored relative to adjacent portions of said support frame, the upper ends of said elastic members supporting at least one end of said sieve frame and said support frame including means operative to vertically adjust the elevation at which the upper ends of the last mentioned elastic members are anchored relative to said support frame, said elastic members supporting said sieve frame from said support frame for omni-directional vibration of said sieve frame in a vertical plane extending longitudinally of said sieve frame, said means operative to vibrate said sieve frame including an eccentrically weighted shaft space centrally intermediate the opposite ends of said sieve frame and journalled from at least two said plates for rotation about a horizontal axis extending transversely of said frame, and motor means drivingly coupled to said shaft for rotating the latter.

4,533,470

APPARATUS FOR TREATING LIQUIDS

Imre Gyulavári, Debrecen, Hungary, assignor to Novex Találmányfejlesztö és Értékesitö Külkereskedelmi Rt., Budapest, Hungary

PCT No. PCT/HU81/00027, § 371 Date Mar. 1, 1982, § 102(e) Date Mar. 1, 1982, PCT Pub. No. WO82/00134, PCT Pub. Date Jan. 21, 1982

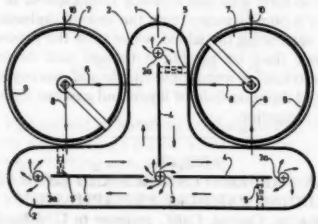
PCT Filed Jun. 30, 1981, Ser. No. 355,542

Claims priority, application Hungary, Jul. 3, 1980, 1653/80

Int. Cl.³ C02F *3/20, 3/16, 3/18*

U.S. Cl. 210—96.1 **21 Claims**

1. Apparatus for the treatment of liquid household and industrial sewages containing contaminants to effect biological purification, aeration and sedimentation comprising a shaped liquid receiving basin having therein an aerating wheel which consists of cross flow aerating channels extending radially from said wheels; said channels separated by at least one partition wall being perpendicular to to each other and forming a path returning into itself forming parallel closed aerating channels and a duct for receiving said liquid sewage and at least one propeller or rotor with axle for moving said sewage through said aerating channels, said propeller or rotor being downstream in the direction of flow in each channel behind the aerating wheel, said aerating channels having therein at least one aerator with axle and at least one fixed air blower for



aerating said liquid sewage; wherein under said aerating channels are vertical aerating shafts, the depth of which is between 1 and 35 meters forming a common space and which with said aerating channels and vertical aerating shafts comprise air-injecting grids in the bottom area of said shafts for injecting air into said sewage through ducts; and wherein there are secondary sedimenters with oblique lamallae which when viewed from the top are circular, said lamallae being connected directly to said secondary sedimenters by ducts through which the aerated sewage flows in transverse flow from said aerating channels and from which the treated sewage is discharged through outflow means.

4,533,471

SELF-CLEANING LIQUID FILTER AND SYSTEM

Henry R. Collins, Jr., P.O. Box 382, Livingston, Tex. 77351

Continuation of Ser. No. 325,928, Nov. 30, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 523,876

Int. Cl.³ B01D *29/38*

U.S. Cl. 210—138 **6 Claims**

1. A self-cleaning liquid filter combination, comprising;

(a) a housing having a first section connected in fluid sealed relationship with a second section;

(b) said first section defining a cylindrical chamber and a fluid inlet disposed at a first end of said cylindrical chamber in axial alignment with said chamber;

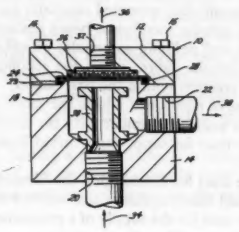
(c) said first section defining a fluid bypass outlet disposed outwardly through the wall of said cylindrical chamber;

(d) said second section defining a fluid outlet disposed in axial alignment with said cylindrical chamber and said inlet;

(e) said first section and said second section cooperatively defining a fluid sealed mount for a flat filter element disposed across the second end of said cylindrical chamber;

(f) a hollow tubular extension member axially mounted within said cylindrical chamber and extending from said first end of said cylindrical chamber to close proximity with the surface of said filter element to define an annular flow clearance between said filter member and said filter surface;

(g) said extension member defining an annular chamber within said cylindrical chamber; and



(h) said combination defining flow communication through said inlet, said extension member, said filter element and said outlet and supplemental flow communication through said inlet, said extensiom member, said annular clearance across said filter surface, said annular chamber and said bypass outlet.

4,533,472

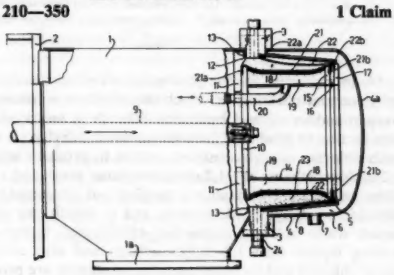
PRESSURE FILTER WITH A TUBULAR, FLEXIBLE FILTER ELEMENT WHICH CAN BE TURNED INSIDE OUT

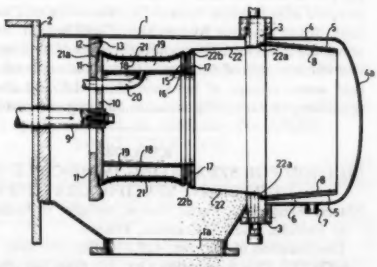
Vittorio Verri, and Renato Christiani, both of Milan, Italy, assignors to Comber S.p.A. Costruzioni Meccaniche Bergamasche, Italy

Filed Nov. 29, 1983, Ser. No. 556,192

Int. Cl.³ B01D *29/42*

U.S. Cl. 210—350 **1 Claim**





1. Pressure filter, particularly for filtering turbid liquids and like suspensions, comprising in combination:

a first frusto-conical, perforated basket having a smaller open end and a larger open end; a second perforated basket;

means supporting the second basket coaxially within the first basket and for guiding the second basket for axial movement from a position of insertion within the first basket to a position spaced therefrom;

a tubular, frusto-conical fabric having a smaller open end and a larger open end, said fabric positioned coaxially between the baskets and fixed at its larger end to the larger end of the first basket and at its smaller end to the second basket;

a tubular membrane, mounted coaxially on the second basket, said tubular membrane being resiliently radially deformable and defining an annular chamber between itself and the tubular fabric when the second basket is in its inserted position within the first basket;

an inner sleeve positioned within the second basket forming a closed inner annular chamber with the tubular membrane;

at least one duct for supplying a turbid liquid to the annular chamber;

at least one duct for discharging the filtered liquid from the side of said fabric opposite said annular chamber; and

at least one duct for the supply of a pressurised fluid into said closed inner annular chamber.

4,533,473

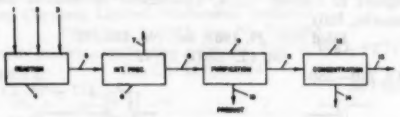
PROCESS FOR TREATING LIQUID CHLORINATED HYDROCARBON WASTES CONTAINING IRON

William M. Burks, Jr., Yorktown Heights, N.Y.; Elliott P. Doane, Monroe, Conn.; Ramsey G. Campbell, Berkeley, and Emilio S. Velez, Richmond, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 378,368, May 14, 1982, abandoned. This application Feb. 2, 1984, Ser. No. 576,243

Int. Cl.³ C02F *1/64*

U.S. Cl. 210—754 **21 Claims**



14. In a process for the production of vinyl chloride from ethylene and chlorine, in which the ethylene is reacted with oxygen and/or air and hydrogen chloride in an oxychlorination section to produce 1,2-dichloroethane, ethylene is reacted with chlorine in a chlorination section to produce additional 1,2-dichloroethane, the 1,2-dichloroethane produced by oxychlorination and chlorination is purified and converted to vinyl chloride by dehydrochlorination, and in which one or more liquid waste streams containing chlorinated hydrocarbons boiling higher than 1,2-dichloroethane and also containing ferric chloride and/or other metallic substances are produced, the improvement comprising removing a substantial portion of the ferric chloride and/or other metallic substances from one or more of said waste streams by contacting said waste streams with dilute aqueous hydrochloric acid which contains from about 0.1 to about 10 percent by weight of hydrogen chloride, in a volume ratio of dilute acid to organic material contained in said waste stream of between about 1:1 and about 3:1 and separating the resulting aqueous and organic phases.

4,533,474

METHOD FOR SEPARATING IMMISCIBLE FLUIDS OF DIFFERENT SPECIFIC GRAVITIES

Marcel Arnaudeau, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

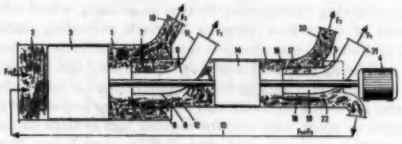
Continuation of Ser. No. 429,576, Sep. 30, 1982, Pat. No. 4,478,712. This application Oct. 22, 1984, Ser. No. 663,514

Claims priority, application France, Sep. 30, 1981, 81 18580

Int. Cl.³ B01D *45/14*

U.S. Cl. 210—787 **6 Claims**

1. A method of use of a device for separating components of a mixture of at least two immiscible fluids of different specific gravities, the device having inlet means connected to a tubular body having at least one coaxial partition internally for withdrawing the mixture at a first end of the tubular body and respective extraction means connected to the tubular body toward the second end thereof for discharging the mixture, one of the at least two immiscible fluids and another of the at least two immiscible fluids, first means for imparting to the mixture, when flowing through the body, a motion having a rotational component about the axis of the tubular body, at least second means adapted for imparting to the fluid passing therethrough a rotational component about the axis of the tubular body and located downstream from the end of one of the partitions inside the tubular body, and feedback means for feeding back the stream, issuing from the second end, to the inlet means, the



method comprising: withdrawing a diphasic fluid comprising liquid hydrocarbons and gaseous hydrocarbons from a submerged oil well; adding and mixing sufficient water to said diphasic fluid to form a second diphasic fluid capable of being pressurized by a pump; pressurizing the second diphasic fluid with a pump; separating the added water from the pressurized second diphasic fluid by passing it though said device for separating a mixture of immiscible fluids; and conveying the thus-pressurized diphasic fluid of liquid and gaseous hydrocarbons through a pipeline.

4,533,475

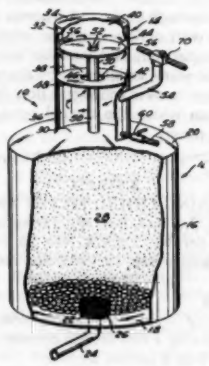
METHOD AND APPARATUS FOR FLUID FILTRATION INCLUDING PARTICLE PRECIPITATION

Richard J. Chiarito, Corona, Calif., assignor to U.M.E., Incorporated, Calif.

Filed Dec. 1, 1983, Ser. No. 556,884

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—788 **18 Claims**



1. A method comprising:

providing a vertically positioned cylindrical tank having a central axis, said cylindrical tank being separated into upper, middle and lower sub-chambers by two baffles, each baffle having an annular opening;

introducing fluid to be filtered into the lowest of said sub-chambers of said vertically positioned cylindrical tank;

circulating said fluid within said tank, below said upper sub-chamber, in a direction generally concentric with the interior surface of said cylindrical tank;

maintaining said fluid below said uppermost sub-chamber for at least one complete rotation about the central axis of the tank permitting undesirable particles to precipitate to the bottom of the tank;

passing fluid through the annular openings in the baffles; and

removing relatively cleaner fluid from said uppermost sub-chamber by way of a conduit.

4,533,476

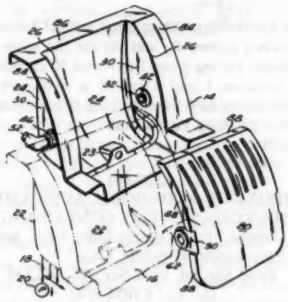
SPA FILTER INSTALLATION METHOD AND MEANS

Jonathan Watkins, San Marcos, Calif., assignor to Watkins Manufacturing Co., Carlsbad, Calif.

Filed May 25, 1984, Ser. No. 614,127

Int. Cl.³ E04H *3/20*; C02F *1/00*

U.S. Cl. 210—805 **12 Claims**



1. The method of installing an elongated recirculation water filter in a spa having a plastic water reservoir with an open top forming a bathing area, comprising:

(a) molding said plastic water reservoir in a female mold and by using vacuum drawing of the plastic of the spa into said mold,

(b) forming a filter location directly within said water reservoir by forming an upwardly, inwardly open filter-receiving reservoir recess with sidewalls spaced at least as wide as said filter is long and with a mouth opening inwardly through which said filter passes in installation at least as wide as said filter is long, said recess being formed by expanding the sidwall of said reservoir in the area of said reservoir recess by forming a matching upwardly, inwardly open female mold recess with a draft permitting removal of said reservoir including said reservoir recess,

(c) providing said reservoir recess with a spa water outlet in each of opposed sidewalls of said reservoir recess, said spa water outlets being generally horizontally aligned, and connecting said outlets in a T-manner to pump means connected to a return water line to said reservoir,

(d) positioning said filter in said reservoir recess by insertion in a direction lateral of said filter through said mouth and connecting said filter to said spa water outlets by applying a compressive force to paired opposite outlet end of said filter and then permitting said filter to expand into engagement and connection with said spa water outlets, and

(e) providing said filter with a pervious central section between said paired opposite outlet ends whereby a fitered recirculating water stream can be drawn directly from said reservior through said pervious section and through said spa water outlets.

7. An installation of a recirculation water filter in a spa having a plastic water reservoir with an open top forming a bathing area, comprising:

(a) a filter station molded directly within said water reservoir by an upwardly, inwardly open filter receiving reservoir recess expanding the reservoir sidewalls in the area of said reservoir recess, said reservoir and reservoir recess being configured with drafts permitting mold release,

(b) said reservoir recess having opposed sidewals spaced apart at least as wide as said filter and having an inwardly open mouth through which said filter must pass in installation at least as wide as said filter, and a wall fitting disposed in each opposed sidewall of said recess, at least one of said fittings including a water outlet, pump means and means connecting said water outlet to said pump means, and a return water line from said pump means to said reservoir,

(c) said filter being positioned in said reservoir recess and having paired end fittings interengaging in two sets with said wall fittings and in fluid communication with said water outlet, said filter having spring mounting means whereby engagement and disengagement of said end fittings can be accomplished by applying manual force to the spring mounted means until engagement or disengagement of fittings and by then permitting spring recovery, and

(d) said filter having a pervious section whereby a filtered water stream can be drawn directly from said reservoir through said pervious section and through said water outlet.

4,533,477

ORGANOPOLYSILOXANES HAVING SIC-BONDED OXYALKYLENE UNITS AND A METHOD FOR PREPARING THE SAME

Gerhard Preiner; Karl Huhn; Johann Müller; Heinrich Marwitz, and Kurt Ullrich, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,476

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1982, 3247825

Int. Cl.³ B05D *3/02*

U.S. Cl. 252—8.9 **18 Claims**

3. A method for preparing organopolysiloxanes having SiC-bonded oxyalkylene units and Si-bonded hydroxyl groups, in which an average of at least 15 mol percent of the siloxane units have only one SiC-bonded monovalent organic radical and the silicon valences other than the one satisfied by the SiC-bonded monovalent organic radical are satisfied by groups selected from the class consisting of siloxane oxygen atoms and oxygen atoms of hydroxyl groups, which comprises reacting a triorganosiloxy end-blocked copolymer of a diorgano(poly)-siloxane which contains SiC-bonded oxyalkylene units and at least 15 mol percent of siloxane units in which each siloxane unit has one SiC-bonded monovalent organic radical and one group selected from the class consisting of an Si-bonded hydrogen atom, an Si-bonded hydroxyl group and an SiOC-bonded alkoxy group having from 1 to 4 carbon atoms with water in the presence of an acid or base.

4,533,478

3-SULFOXY-1,2-PROPYLENE GLYCOLS-1-ESTERS OF TRICYCLO (4.2.2.0^{2,5}) DEC-9-ENE-3,4,7,8-TETRACARBOXYLIC ACID

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 485,670, Apr. 18, 1983, Pat. No. 4,506,093. This application Oct. 11, 1984, Ser. No. 659,845

Int. Cl.³ E21B *43/22*

U.S. Cl. 252—8.55 D **1 Claim**

1. A method of injecting a micellar slug into a subterranean formation comprising the steps of:

(1) contacting said formation with an aqueous fluid composition comprising water, a surfactant, a hydrocarbon, an electrolyte and a cosurfactant comprising 3-sulfoxy-1,2-propylene glycols-1-esters of tricyclo (4.2.2.0^{2,5}) dec-9-ene-3,4,7,8-tetracarboxylic acid of molecular weight of from about 400 to about 1200,

(2) applying sufficient pressure to said composition to cause said micellar slug to move through said formation,

(3) maintaining sufficient pressure while injecting said composition into said formation.

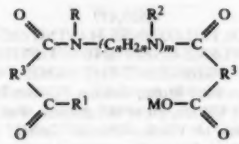
4,533,479

CORROSION INHIBITORS FOR AQUEOUS LIQUIDS FOR THE WORKING OF METALS, AND A PROCESS FOR THEIR PREPARATION

Francesco Cargnino, Venaria; Giuseppe Natoli, Torino, both of Italy, and Horst Lorke, Liederbach, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,800
Claims priority, application Italy, Oct. 25, 1982, 23903 A/82
Int. Cl.³ C10M *3/30*
U.S. Cl. 252—34 **5 Claims**

1. A compound of the formula



wherein

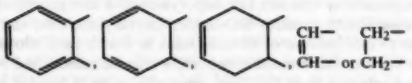
R denotes hydrogen or hydroxymethyl,

R^1 denotes a mono-(C_2–C_5)-alkylamino group, a di-(C_2–C_5)-alkylamino group, a mono-(C_2–C_5)-hydroxyalkylamino group or a di-(C_2–C_5)-hydroxyalkylamino group or

R^1 together with R denotes a direct bond, the nitrogen atom shown as bearing the R substituent being in that case bonded directly to the carbonyl carbon atom bearing the R^1 substituent,

R^2 denotes hydrogen or hydroxymethyl,

R^3 denotes a group of the formula



n denotes 2 or 3,

m denotes a number between 1 and 4 and

M denotes mono-, di- or tri-ethanolammonium or isopropanolammonium.

5. An aqueous lubricant composition comprising therein between about 0.5% and 5.0% weight of a compound of claim 1.

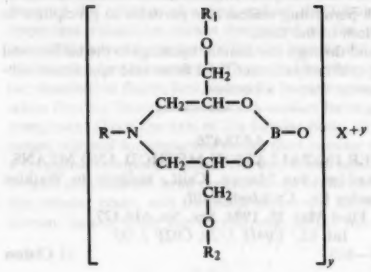
4,533,480

BIS(HYDROCARBYLOXY METHYLATED) BORON-CONTAINING, HETEROCYCLIC COMPOUNDS AND LUBRICATING COMPOSITIONS CONTAINING THE SAME

Richard A. Holstedt, Whittier, and Peter J. Jessup, Santa Ana, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 18, 1983, Ser. No. 476,513
Int. Cl.³ C10M *1/20, 1/32, 1/54*
U.S. Cl. 252—46.4 **34 Claims**

1. A compound having the formula:



where R is hydrogen or an organic radical having from 1 to about 30 carbon atoms, R_1 and R_2 are the same or different organic radicals having from 1 to about 50 carbon atoms, y is an integer between 1 and 4 and X is hydrogen or a metal selected from a transition metal having an atomic number of 21 through 30 or a Group IVA metal.

4,533,481

POLYCARBOXYLIC ACID/BORIC ACID/AMINE SALTS AND AQUEOUS SYSTEMS CONTAINING SAME

Richard W. Jahnke, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 20, 1983, Ser. No. 486,638
Int. Cl.³ C10M *3/48*
U.S. Cl. 252—49.6 **19 Claims**

1. Amine boron carboxylic salts useful as metal corrosion inhibitors for use in aqueous systems derived from

(A) at least one polycarboxylic acid (I) corresponding to the formula

$$R(COOH)_{2\text{-}3} \quad \text{(I)}$$

wherein R is an alkylene, alkenylene, alkynylene or hydroxyl alkylene group of about 4 to about 25 carbon atoms,

(B) at least one monoamine (II) corresponding to the formula

$$(R')_3N \quad \text{(II)}$$

wherein each R' is independently hydrogen, a $C_{1\text{-}20}$ hydrocarbyl or a $C_{2\text{-}20}$ hydroxyl hydrocarbyl group, and

(C) a boron compound comprising at least one of boric acid, boron trioxide, boron halides and esters of boric acid; wherein said amine boron carboxylic salts are formed by neutralizing said carboxylic acid (I) and said boron acid with said amine (II) at an elevated temperature which does not exceed 100° C.

4,533,482

HYDROGENATED DIOLEFIN-LOWER ALKYL ACRYLATE OR METHACRYLATE VISCOSITY INDEX IMPROVING COPOLYMERS FOR LUBRICATING OILS

Joseph M. Bollinger, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

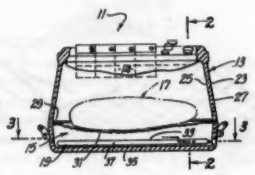
Filed Dec. 30, 1982, Ser. No. 454,749
Int. Cl.³ C10M *1/28*
U.S. Cl. 252—56 R **15 Claims**

1. A lubricating oil containing a viscosity index improving amount of a substantially hydrogenated, random copolymer comprising the polymerized product of a conjugated diolefin having six carbon atoms or less per molecule, and a lower alkyl acrylate or lower alkyl methacrylate where the alkyl group contains eight carbon atoms or less per molecule.

4,533,483
HEAT SOURCE PROVIDING A SUBSTANTIALLY CONSTANT TEMPERATURE

Susan S. Watson, and William K. R. Watson, both of San Diego, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 2, 1973, Ser. No. 375,332
Int. Cl.³ C09K 3/18
U.S. Cl. 252—70 20 Claims



1. In combination for forming a eutectic composition having a first melting temperature and having properties of remaining in a fluid state at temperatures below the first melting temperature and of being triggered into a crystalline state at the first melting temperature in an exothermic reaction:

a first chemical having a second melting temperature higher than the first melting temperature of the eutectic composition and having properties including a fluid form at temperatures above the second melting temperature, the first chemical being supercoolable to maintain the fluid form even at temperatures below the second melting temperatures and of being triggered into the crystalline state at the second melting temperature in an exothermic reaction;

a second chemical having a third melting temperature higher than the first melting temperature of the eutectic composition and having properties including a fluid form at temperatures above the third melting temperature, the second chemical being supercoolable to maintain the fluid form even at temperatures below the third melting temperature and of being triggered into the crystalline state at the second melting temperature in an exothermic reaction; and

the first melting temperature being dependent upon the proportions by weight of the first and second chemicals in the eutectic composition.

4,533,484
PIGMENTS FOR TOILETRIES

Wilhelm E. Walles, Freeland; William H. Keskey, and Richard G. Young, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 6, 1983, Ser. No. 539,496
Int. Cl.³ C08J 3/20; C09B 69/10; C09F 26/06; C11D 9/20
U.S. Cl. 252—117 20 Claims

1. A method for preparing a substantially insoluble organic pigment wherein a water-soluble organic dye is contacted with a polymer comprising X-alkyl-2-oxazolidinone moieties in an aqueous medium under conditions such that the dye can become chemically bound to the polymer, and under conditions in which the polymer is at least partially soluble, and precipitating the resulting pigment to yield pigment particles having the insolubility characteristics of the polymer and the color characteristics of the dye under conditions at which the pigment is used.

14. A bar of soap containing a pigment which pigment is a substantially insoluble organic pigment, and wherein said pigment is prepared by contacting a water-soluble dye with a polymer comprising X-alkyl-2-oxazolidinone moieties to yield pigment particles having the insolubility characteristics of the polymer and the color characteristics of the dye.

4,533,485
ANIONIC SURFACTANT ADDITION PRODUCTS OF MALEIC OR FUMARIC ACID AND A POLY(OXYALKYLATED) ALCOHOL

James M. O'Connor, Clinton; Michael Scardera, Hamden, and Frank R. Grosser, Bethany, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jun. 20, 1983, Ser. No. 505,663
Int. Cl.³ C11D 7/06; C07C 59/305, 59/58, 69/60
U.S. Cl. 252—156 9 Claims

1. A surfactant composition made by the process comprising:

a. forming a carboxylic acid group-containing additional product by reacting presence of a peroxy-type free-radical initiator an ethylenically unsaturated dicarboxylic acid selected from the group consisting of maleic acid, fumaric acid, and mixtures thereof, with at least one poly(oxyalkylated) alcohol having the formula:

$$R-O-(CH_2-\underset{R_1}{CH}-O)_x-(CH_2-\underset{R_2}{CH}-O)_y-(CH_2-\underset{R_3}{CH}-O)_z-H$$

wherein R is a hydrocarbon-containing radical having an average of from about 6 to about 18 carbon atoms; R_1, R_2, and R_3 are individually selected from hydrogen and methyl with the proviso that R_2 is different than R_1 and R_3; x is an integer having a value from 1 to about 25; y is an integer having a value from about 1 to about 25; and z is an integer from about 0 to about 25; in the said weight ratio of said poly(oxyalkylated) alcohol to said dicarboxylic acid being from about 95:5 to about 40:60; and

b. neutralizing said addition product with a sufficient amount of a neutralizing agent to convert at least a major portion of said carboxylic acid groups to salt groups.

9. An aqueous solution comprising water and at least about 10% by weight of an alkali metal hydroxide and an effective surface active amount of the surfactant of claim 1.

4,533,486
SULFATED ADDITION PRODUCTS OF SELECTED UNSATURATED DICARBOXYLIC ACIDS AND POLY(OXYALKYLATED) ALCOHOLS AS ANIONIC SURFACTANTS

Michael Scardera, Hamden, and John G. Bayusik, Wallingford, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Sep. 24, 1984, Ser. No. 653,176
Int. Cl.³ C11D 1/06, 1/08, 1/29, 3/04
U.S. Cl. 252—156 18 Claims

1. A surfactant composition made by the process comprising:

a. forming a carboxylic acid group-containing addition product by reacting, in the presence of a peroxy-type free-radical initiator, an ethylenically unsaturated dicarboxylic acid selected from the group consisting of maleic acid and fumaric acid and mixtures thereof, with at least one poly-(oxyalkylated) alcohol having the formula:

$$R-O-(CH_2-\underset{R_1}{CH}-O)_x-(CH_2-\underset{R_2}{CH}-O)_y-(CH_2-\underset{R_3}{CH}-O)_z-H$$

wherein R is a hydrocarbon-containing radical having an average of from about 6 to about 18 carbon atoms; R_1, R_2, and R_3 are individually selected from hydrogen and methyl with the proviso that R_2 is different than R_1 and R_3; x is an integer having a value from 1 to about 25; y is an integer having a value from about 1 to about 25; and z is an integer from about 0 to about 25; in the said weight ratio of said poly(oxyalkylated) from about 95:5 to about 40:60; and

b. sulfating said addition product with a sufficient amount of

a sulfating agent to convert at least a major portion of said terminal hydroxyl groups to sulfonate groups.

17. An aqueous solution comprising water and at least about 10% by weight of an alkali metal hyroxide and an effective surface active amount of the surfactant of claim 1.

4,533,487

PROCESS FOR PRODUCING BLENDED D-LIMONENE AND USES OF THE BLENDED PRODUCT

Clarence L. Jones, Houma, La., assignor to Pitre-Jones, Houma, La.

Continuation-in-part of Ser. No. 523,049, Aug. 15, 1983, abandoned. This application Sep. 27, 1984, Ser. No. 654,902

Int. Cl.³ C11D *1/83, 3/18, 3/43, 11/00*

U.S. Cl. 252—170 **7 Claims**

1. A process for producing a d-Limonene cleaning agent, which comprises the following steps:

a. providing d-Limonene compound;

b. blending said compound with a 2:1 to 3:1 ratio of a liquid detergent selected from anionic and ionic surfactants and mixtures thereof;

c. agitating said blended mixture;

d. adding a mixture of bicarbonate of soda and slaked lime solution in a range of 2:1 to 3:1 by volume during the agitation of said mixture;

e. mixing said agitated mixture with pressurized water at a ratio of 3:1 of water to d-Limonene mixture;

f. allowing said hydrated mixture to separate into a top emulsified layer and a bottom clear liquid layer; and

g. decanting said clear liquid layer for use as said cleaning agent.

4,533,488

PYRIMIDINE DERIVATIVES

Masahiro Fukui; Kisei Kitano; Masami Tanaka, and Yasuyuki Goto, all of Yokohamashi, Japan, assignors to Chisso Corporation, Osaka, Japan

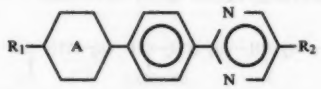
Filed Aug. 24, 1983, Ser. No. 525,881

Claims priority, application Japan, Aug. 26, 1982, 57-148283

Int. Cl.³ C09K *3/34;* **G02F** *1/13;* **C07D** *239/26, 239/24*

U.S. Cl. 252—299.61 **12 Claims**

1. A compound having the general formula



wherein R_1 and R_2 each represent an alkyl group or an alkyloxy group having 1 to 10 carbon atoms and

represents a cyclohexane ring or benzene ring.

4,533,489

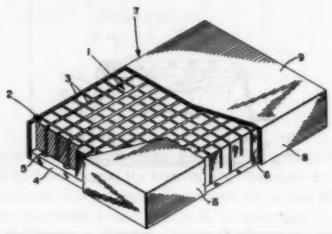
FORMABLE LIGHT REFLECTIVE COMPOSITIONS

Bradley K. Utts, Oakwood Village, and Oley D. Wimer, Hudson, both of Ohio, assignors to Harshaw/Filtrol Partnership, Cleveland, Ohio

Filed Dec. 7, 1983, Ser. No. 559,150

Int. Cl.³ C09K *11/06*

U.S. Cl. 252—301.17 **25 Claims**



1. A light-reflective, self-leveling flowable and curable composition comprising a silicone resin containing a mixture of aluminum oxide particles wherein the particles comprise a mixture of

(a) particles having an average particle size of about 3 microns, and

(b) particles having an average particle size of about 0.03 microns, said mixture of particles being present in an amount sufficient to provide the desired light-reflectance/transmittance characteristics to the cured composition.

4,533,490

PROCESS FOR PRODUCING WATER GLASS FOAMS FROM AEROSOL CONTAINERS

Hermann Kluth; Bernhard Röderhoff, both of Dusseldorf; Wolfgang Friedemann, Neuss; Jürgen Wegner, and Wolfgang Dierichs, both of Dusseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 19, 1983, Ser. No. 515,040

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244523

Int. Cl.³ B01J *13/00;* **C04B** *43/00;* **C09K** *3/30*

U.S. Cl. 252—305 **19 Claims**

1. A process for producing in situ foams based on alkali metal silicates characterized in that (A) an aqueous alkali metal silicate solution containing from 0.1% to 2.56% by weight, based on the amount of said alkali metal silicate solution of an emulsifier which is stable to alkalis and which, when mixed with said alkali metal silicate solution, does not produce any increase in viscosity or any precipitations in said alkali metal silicate solution, said emulsifier being selected from the group consisting of adducts of fatty alcohols with ethylene oxide and monoesters of sulfosuccinic acid with tallow fatty acid monoethanolamide, on the one hand and (B) a hardener solution on the other hand are accomodated in separate pressurized containers A and B, prior to use the hardener solution in container B is added to and mixed with the silicate solution in container A in the presence of a propellent gas liquid under high pressure between 0° and 50° C., and on actuation of the discharge valve of container A, an alkali metal silicate foam is discharged.

4,533,491

ORGANOLEPTIC USE OF METHYL SUBSTITUTED PINYL OXOPENTENES

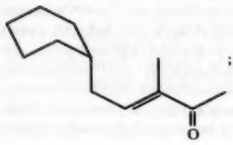
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Robin K. Wolff, Point Pleasant; Richard M. Boden, Ocean, and Takao Yoshida, West Long Branch, all of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

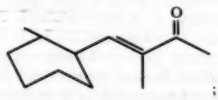
Division of Ser. No. 396,485, Jul. 8, 1982, Pat. No. 4,424,378, which is a continuation-in-part of Ser. No. 362,237, Mar. 26, 1982, Pat. No. 4,428,387. This application May 20, 1983, Ser. No. 496,679

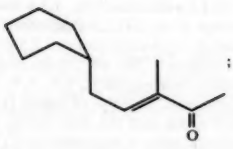
Int. Cl.³ A61K 7/46

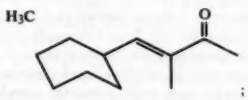
U.S. Cl. 252—522 R **1 Claim**

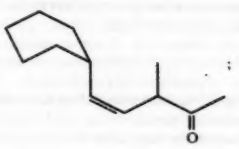
1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions and colognes comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one bicyclic oxo compound having a structure selected from the group consisting of compounds having the structures:











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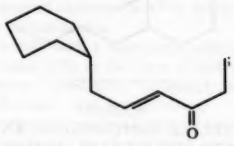
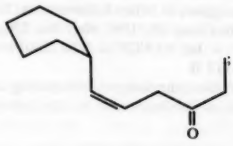
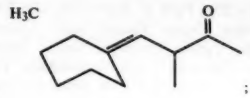
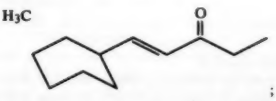
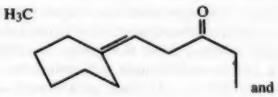


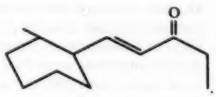








and



4,533,492

ACETYL DIMETHYLBUTYLCYCLOHEXENE AND ORGANOLEPTIC USES THEREOF

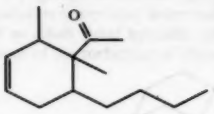
Richard J. Tokarzewski, Atlantic Highlands, and William L. Schreiber, Jackson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 482,824, Apr. 7, 1983, Pat. No. 4,449,009. This application Feb. 9, 1984, Ser. No. 578,626

Int. Cl.³ C11B 9/00

U.S. Cl. 252—522 R **7 Claims**

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of perfume compositions, colognes, perfumed articles, smoking tobacco compositions and smoking tobacco articles comprising the step of adding to said consumable material an aroma or taste augmenting or enhancing quantity of the compound defined according to the structure:



4,533,493

THEOPHYLLINE IMMUNOGENS, ANTIBODIES, LABELED CONJUGATES, AND RELATED DERIVATIVES

Jeffrey L. Benovic, Durham, N.C.; Robert T. Buckler, Edwardsburg, Mich.; John F. Burd, and Thomas M. Li, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 27, 1981, Ser. No. 296,817
Int. Cl.[3] C07G 7/00, 7/02
U.S. Cl. 260—112 B 15 Claims

1. A theophylline immunogen comprising theophylline covalently linked at its 9-position to an immunogenic carrier material.

4,533,494

PROCESS FOR PURIFYING SECRETIN

Mikio Uchiyama, Urawa; Takashi Sato, Tokyo; Hiroshi Yoshino, Abiko; Yutaka Tsuchiya, Tokyo; Masayuki Konishi, Ichinomiya; Masahiko Tsujii, Kagamihara; Yoshihiko Hisatake, Kohnan, and Atsushi Koiwa, Gifu, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,691
Claims priority, application Japan, Feb. 15, 1982, 57-21311
Int. Cl.[3] C07C 103/52
U.S. Cl. 260—112.5 R 10 Claims

1. A process for purifying crude secretin selected from the group consisting of synthetic crude secretin and natural crude secretin, which comprises subjecting the crude secretin to reversed-phase, high-performance, liquid chromatography using, as an eluant, a solvent mixture of (1) an aqueous solution of a substance selected from the group consisting of hydrochloric acid, trifluoroacetic acid, phosphoric acid, perchloric acid, sodium phosphate and sodium perchlorate, and (2) a polar organic solvent which is miscible with water and is selected from the group consisting of acetonitrile, methyl alcohol, ethyl alcohol, isopropyl alcohol and tetrahydrofuran, and using, as a stationary phase, column packing of silica gel particles having alkyl or cyanopropyl groups chemically bonded thereto, and thereby obtaining a purified secretin having a biological activity of higher than 5000 cu/sq; (as acetate) and higher than 6000 cu/mg (on dry, free basis).

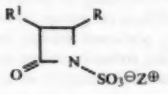
4,533,495

METHOD OF PRODUCING 2-AZETIDINONE-1-SULFONIC ACID COMPOUNDS

Kouichi Yoshioka, Kyoto, and Michihiko Ochiai, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

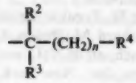
PCT No. PCT/JP82/00044, § 371 Date Dec. 30, 1982, § 102(e) Date Dec. 30, 1982
PCT Filed Feb. 19, 1982, Ser. No. 456,075
Int. Cl.[3] C07D 205/08, 403/12, 403/06, 401/12
U.S. Cl. 260—239 A 4 Claims

1. A method of producing a compound of the formula:



wherein R is

(1) a group of the formula:



wherein n is an integer of 0 to 3; R^2 and R^3 which may be the same or different, stand for hydrogen, alkyl, cycloalkyl*, aralkyl*, aryl*, heterocyclic* group, alkoxycarbonyl or acyl, or R^2 and R^3 taken together stand for oxo; and R^4 is hydrogen, alkyl, cycloalkyl*, aryl*, a heterocyclic* group, halogen, cyano, hydroxy, alkoxy, aryl*-oxy, aralkyl*-oxy, acyloxy, carbamoyloxy, hydroxysulfonyloxy, alkylsulfonyloxy, aryl*-sulfonyloxy, sulfoxy, nitro, amino, azido, carboxy, alkoxycarbonyl, alkoxycarbonylalkyloxy, aminocarbonyl, alkylthiocarbonyl, acyl, mercapto, alkylthio, aminoalkylthio, acylaminoalkylthio, aralkyl*-thio, aryl*-thio, or heterocyclic*-thio [or quaternary ammonium*],

(2) unsubstituted or substituted alkenyl or alkynyl, the substituent being cycloalkyl*, cycloalkenyl*, aryl*, a heterocyclic* group, alkoxycarbonyl, acyl, oxo, halogen, cyano, hydroxy, alkoxy, aryl*-oxy, acyloxy, carbamoyloxy, hydroxysulfonyloxy, alkylsulfonyloxy, aryl*-sulfonyloxy, nitro, amino, carboxy, aminocarbonyl, alkylthiocarbonyl, mercapto, alkylthio, aminoalkylthio, acylaminoalkylthio, aralkyl*-thio, aryl*-thio, or heterocyclic*-thio [or quaternary ammonium*], or

(3) unsubstituted or substituted cycloalkyl, cycloalkenyl, aryl or a heterocyclic group, the substituent being alkyl, alkoxy, alkenyl, aryl, aralkyl, mercapto, alkylthio, arylthio, aralkylthio, alkylsulfonyl, arylsulfonyl, aralkylsulfonyl, hydroxy, oxo, thioxo, halogen, nitro, amino, cyano, carbamoyl, carboxy, acyl, acyloxy, acylamino, hydroxyalkyl, carboxyalkyl, haloalkyl or mono- or dialkylaminoalkyl, and in the above groups (1) to (3),

(a) the heterocyclic group is 2- or 3-pyrrolyl, 2- or 3-furyl, 2- or 3-thienyl, 2- or 3-pyrrolidinyl, 2-, 3- or 4-pyridyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 2-, 3- or 4-piperidinyl, 2, 3- or 4-pyranyl, 2-, 3- or 4-thiopyranyl, pyrazinyl, 2-, 4- or 5-thiazolyl, 2-, 4- or 5-oxazolyl, 3-, 4- or 5-isothiazolyl, 3-, 4- or 5-isoxazolyl, 2-, 4- or 5-imidazolyl, 3-, 4- or 5-pyrazolyl, 3- or 4-pyridazinyl, N-oxido-3- or 4-pyridazinyl, 2-, 4- or 5-pyrimidinyl, N-oxido-2-, 4- or 5-pyrimidinyl, piperazinyl, 4- or 5-(1,2,3-thiadiazolyl), 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 1,2,5-thiadiazolyl, 4- or 5-(1,2,3-oxadiazolyl), 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,2,3- or 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, pyrido [2,3-d]pyrimidyl, benzopyranyl, 1,8-, 1,5-, 1,6-, 1,7-2,7- or 2,6-naphtyhridyl, quinolyl or thieno [2,3-b]pyridyl,

(b) the acyl group and the acyl moiety of the acyloxy, acylaminoalkylthio or acylamino is C_{1-6} alkylcarbonyl, benzoyl, 4-hydroxybenzoyl, 4-methoxybenzoyl, phenylacetyl, 4-hydroxyphenylacetyl, 4-methoxyphenylacetyl, 2-thienylcarbonyl, 2-furylcarbonyl, 2-, 4- or 5-thiazolylacetyl, 2- or 3-thienylacetyl, 2- or 3-furylacetyl or 2-amino-4- or 5-thiazolylacetyl, and

(c) the cycloalkyl, aralkyl, aryl, heterocyclic and cycloalkenyl group with subscript asterish "*" may be substituted with the substituent as defined above in (3),

R^1 is

(1)′ an amino,

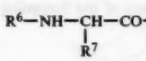
(2)′ an acylated amino group wherein the acyl moiety is

(i) a group of the formula:

R^5—CO—

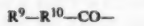
wherein R^5 is alkyl other than C_{1-5} alkyl—CH_2— or a heterocyclic* group,

(ii) a group of the formula:

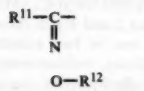


wherein R^6 is hydrogen, an amino acid residue, an amino-protective group or a group R^8—(CH_2)-n_1—CO— where R^8 is a heterocyclic* group and n_1 is an integer of 0 to 2, and R^7 is an alkyl, phenyl*, heterocyclic*-carbonylamino or a heterocyclic group,

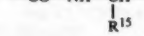
(iii) a group of the formula:



wherein R^9 is a group

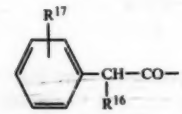


where R^{11} is alkyl*, a heterocyclic* group or phenyl* and R^{12} is hydrogen, an alkyl, alkenyl or a group —R^{1-3}—R^{14} where R^{13} is an alkylene or alkenylene and R^{14} is phenyl*, carboxyl or an ester thereof, or mono- or di-alkylamino, and R^{10} is a direct bond or a group



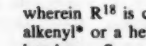
where R^{15} is an alkyl, phenyl* or thiazolyl*,

(iv) a group of the formula:



wherein R^{16} is hydroxy, hydroxysulfonyloxy, carboxy, ureido*, sulfamoyl*, sulfo, phenoxycarbonyl* or formyloxy and R^{17} is hydrogen, an alkyl, an alkoxy, halogen, nitro or hydroxy, or

(v) a group of the formula:



wherein R^{18} is cyano, phenyl*, phenoxy*, an alkyl*, alkenyl* or a heterocyclic* group and R^{19} is a direct bond or —S—, and in the above groups (i) to (v),

(a)′ the heterocyclic group is as defined above in the group R,

(b)′ the amino acid residue is glycyl, alanyl, valyl, leucyl, isoleucyl, seryl, theonyl, cysteinyl, cystyl, methionyl, α- or β-aspartyl, α- or γ-glutamyl, lysyl, arginyl, phenylalanyl, phenylglycyl, tyrosyl, histidyl or tryptophanyl,

(c)′ the amino-protective group in R is phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, acetyl, propionyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoroacetyl, maleyl succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β, β, β, -trichloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, di-phenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, phenyloxycarbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl,

(d)′ the alkyl group with a superscript asterisk "*" may be substituted with halogen, hydroxy, cyano or trifluoromethyl,

(e)′ the ester of carboxyl in R^{14} is an alkyl ester having 1 to 6 carbon atoms,

(f)′ the ureido with a superscript asterisk "*" may be substituted sulfo in the form of salt with sodium or potassium; carbamoyl; sulfamoyl; amidino; or an alkyl having 1 to 3 carbon atoms,

(g)′ the sulfamoyl with a superscript asterisk "*" may be substituted with an alkyl having 1 to 3 carbon atoms or amidino,

(h)′ the alkenyl with a superscript asterisk "*" may be substituted with carboxy or cyano, and

(i)′ the heterocyclic, phenyl, thiazolyl, phenoxycarbonyl and phenoxy with a superscript asterisk "*" may be substituted with the substituent as defined above in (3)

(3)′ amino protected with phthaloyl, p-nitrobenzoyl, p-tert-butylbenzoyl, p-tert-butylbenzenesulfonyl, benzenesulfonyl, toluenesulfonyl, formyl, monochloroacetyl, dichloroacetyl, trichloroacetyl, methanesulfonyl, ethanesulfonyl, trifluoro-acetyl, maleyl, succinyl, methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, isopropoxycarbonyl, 2-cyanoethoxycarbonyl, β, β, β-tri-chloroethoxycarbonyl, β-trimethylsilylethoxycarbonyl, β-methylsulfonylethoxycarbonyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethyloxycarbonyl, methoxymethyloxycarbonyl, acetylmethyloxycarbonyl, isobornyloxycarbonyl, pnenyloxy-carbonyl, trityl, 2-nitrophenylthio, benzylidene, 4-nitrobenzylidene, trialkylsilyl, benzyl or p-nitrobenzyl, or

(4)′ an azide group, and in the above (1)–(3) and (2) ′, the amino, carboxyl and hydroxyl group may be protected; the alkyl is C_{1-6} alkyl; the cycloalkyl is C_{3-8} cycloalkyl; the alkenyl is C_{2-6} alkenyl; the alkynyl is C_{2-6} alkynyl; the cycloalkenyl is C_{3-8} cycloalkenyl; the aryl is phenyl, α-naphthyl, β-naphthyl, biphenyl or anthryl; the alkoxy is C_{1-6} alkoxy; the aralkyl is benzyl, phenethyl, phenylpropyl or naphthylmethyl; the alkylene is C_{1-3} alkylene; and the alkenylene is C_{2-4} alkenylene, and $Z^{\oplus}$ is a group of the formula:

wherein R^{20}, R^{21}, R^{22} and R^{23} each is an alkyl*, cycloalkyl*, alkenyl*, cycloalkenyl or aryl as defined above in the groups R and R^1 and the total number of carbon atoms of R^{20}–R^{23} is 10 to 30, characterized by reacting a compound of the formula:

wherein the symbols have the same meanings as respectively defined above, with (1) an acid halide, (2) an acid anhydride, (3) an amide with pyrazole, imidazole, 4-substituted imidazole, dimethylpyrazole or benzotriazole, (4) an ester from the group of methyl ester, ethyl ester, methoxymethyl ester, propargyl ester, 4-nitrophenyl ester, 2,4-dinitrophenylester, trichlorophenyl ester, pentachlorophenyl ester, mesylphenyl ester and esters with 1-hydroxy-1H-2-pyridone, N-hydroxy-succinamide or N-hydroxyphthalimide or (5) a thioester with 2-pyridylthiol or 2-bensothiazolylthiol of a carboxylic acid of the formula:

wherein R^1 has the same meaning as defined above, in the presence of a base.

4,533,496

METHOD OF ISOLATING MONOCLONAL ANTIBODIES FROM HYBRIDOMA CULTURES

Charles Lewis, Jr., Hazelwood; Jitka V. Olander, University City, and William R. Tolbert, Manchester, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 8, 1984, Ser. No. 608,283

Int. Cl.³ C07G 7/00, 7/028

U.S. Cl. 260—112 R **15 Claims**

1. A method of isolating monoclonal antibodies from spent culture medium of the in vitro growth of hybridoma cells comprising treating said spent cell culture medium or a concentrate thereof by adsorption with a water-insoluble, cross-linked polyelectrolyte copolymer of olefinically unsaturated monomer having from 2 to about 4 carbon atoms and α,β-unsaturated polycarboxylic acid or anhydride having from 4 to about 6 carbon atoms containing pendant diloweralkylaminoloweralkylimide functional groups.

4,533,497

N-ETHYLIDENE AZETIDINONES

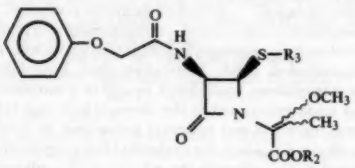
Douglas O. Spry, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 27, 1982, Ser. No. 453,563

Int. Cl.³ C07D 205/08, 401/06, 403/12, 403/06

U.S. Cl. 260—239 A **6 Claims**

1. A compound of the formula

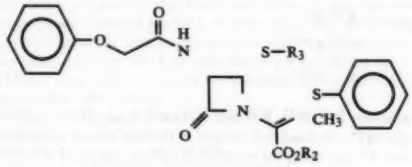


wherein:

R_2 is hydrogen, methyl, benzyl, 4-methoxybenzyl, diphenylmethyl, or t-butyl; and

R_3 is C_1 to C_4 alkyl or phenyl.

4. A compound of the formula



wherein:

R_2 is hydrogen, methyl, benzyl, 4-methoxybenzyl, diphenylmethyl, or t-butyl; and

R_3 is C_1 to C_4 alkyl or phenyl.

4,533,498

COMPOUNDS

Francis E. Blaney, London; Michael S. Hadley, Sawbrideworth; Francis D. King, Newport, and Eric A. Watts, Harlow, all of England, assignors to Beecham Group p.l.c., Brentford, England

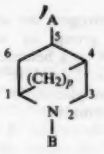
Filed Jan. 26, 1984, Ser. No. 574,089

Claims priority, application United Kingdom, Jan. 29, 1983, 8302483

Int. Cl.³ A61K 31/54

U.S. Cl. 260—243.3 **11 Claims**

1. A compound of formula (I), or a pharmaceutically acceptable salt, quaternary derivative or N-oxide thereof, or a pharmaceutically acceptable solvate of any of the foregoing:



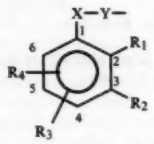
(I)

wherein

p is 1 to 3;

B is C_{1-7} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl-C_{1-2} alkyl, or a group $(CH_2)_tR_{11}$ where t is 1 or 2 and R_{11} is thienyl or furyl optionally substituted by one or two substituents selected from C_{1-6} alkyl, C_{1-6} alkoxy, trifluoromethyl or halogen, or is phenyl optionally substituted by one or two substituents selected from C_{1-4} alkoxy, trifluoromethyl, halogen, nitro, carboxy, esterified carboxy, and C_{1-4} alkyl optionally substituted by hydroxy, C_{1-4} alkoxy, carboxy, esterified carboxy or in vivo hydrolysable acyloxy; and

(i) A is a group of formula (II):



(II)

in which either

(a) one of X and Y is CO and the other is NH; and

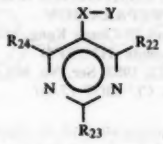
R_1 is selected from halogen, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, and amino optionally substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl C_{1-4} alkyl, phenyl and phenyl C_{1-4} alkyl groups or optionally N,N-disubstituted by C_{4-5} polymethylene; or X is CO and Y is NR_6 where R_1 and R_6 together are C_{1-2} alkylene; and

either R_2, R_3 and R_4 are each independently selected from the class of hydrogen, halogen, CF_3, C_{1-6} alkyl, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-7} acyl, C_{1-7} carboxylic acylamino, C_{1-6} alkylsulphonylamino, N-(C_{1-6}alkyl-sulphonyl)-N-C_{1-4} alkylamino, C_{1-6} alkylsulphonyl, C_{1-6} alkylsulphinyl, hydroxy, nitro, or amino, aminocarbonyl, aminosulphonyl, aminosulphonylamino or N-(aminosulphonyl)-N-C_{1-4} alkylamino optionally N-substituted by one or two groups selected from C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{3-8} cycloalkyl C_{1-4} alkyl, phenyl and phenyl C_{1-4} alkyl or optionally N,N-disubstituted by C_{4-5} polymethylene; or one of R_2, R_3 and R_4 is selected from the foregoing class and the remaining two of R_2, R_3 and R_4 when on adjacent atoms are together C_{1-2} alkylenedioxy; or

(b) one of X and Y is CO and the other is NH; R_1 and R_2 together are C_{1-2} alkylenedioxy or C_{1-2} oxyalkylenethio, or C_{2-3} alkyleneoxy in which the oxygen atom is attached to the ring at the 2-position; as depicted in formula (II); and

R_3 and R_4 are each independently selected from the class of values recited hereinbefore for R_2, R_3 and R_4 in paragraph (i) (a) hereinbefore or when on adjacent atoms are together C_{1-2} alkylenedioxy; or

(ii) A is a group of formula (III):



(III)

in which

one of X and Y is CO and the other is NH; and

R_{22}, R_{23} and R_{24} are each independently selected from the class of values of the variables R_2, R_3 and R_4 as defined hereinbefore in paragraph (i) (a) in relation to formula (II), except C_{1-2} alkylenedioxy.

4,533,499

PROCESS FOR THE PRODUCTION OF TRIARYL METHANE COMPOUNDS

Malcolm C. Clark, Cheadle; John B. Henshall, Manchester, and Derrick A. Hart, Rochdale, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 232,081, Feb. 6, 1981, abandoned. This application Apr. 6, 1984, Ser. No. 597,213

Claims priority, application United Kingdom, Feb. 14, 1980, 8005014; Oct. 10, 1980, 8032773

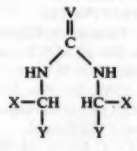
Int. Cl.[3] C07D *405/2, 307/83;* C09B *11/10*

U.S. Cl. 260—391 11 Claims

1. A process for the production of a leuco compound of the formula

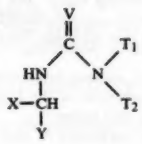
(I)

which comprises the steps of preparing either an intermediate of the formula



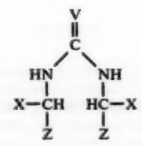
(2a)

or



(2b)

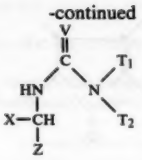
or a mixture of the compounds (2a) and (2b), or an intermediate of the formula



(2c)

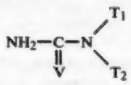
or

-continued

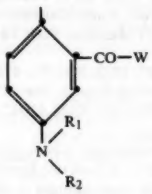


(2d)

or a mixture of compounds (2c) and (2d) by reacting under strong, non-oxidizing acidic conditions an urea derivative of the formula

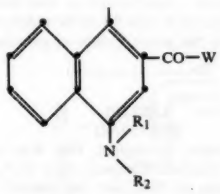


with one or two moles of an aldehyde X—CHO, Y—CHO or Z—CHO plus an equimolar amount of a compound X—H, Y—H or Z—H having an activated hydrogen atom, isolating said intermediate or mixture of intermediates, and then reacting said intermediate or mixture of intermediates with a compound of the formula Z—H or Y—H having an activated hydrogen atom under strong non-oxidizing acidic conditions, wherein Z represents an aryl radical of the formula



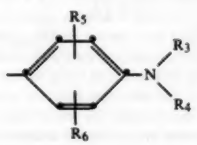
(4a)

or



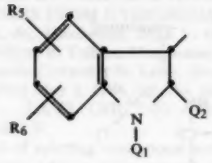
(4b)

and X and Y are the same or different and each represents an amino substituted phenyl radical of the formula



(5a)

or an indolyl radical of the formula



(5b)

wherein R_1, R_2, R_3, R_4 independently represent hydrogen, C_1–C_4-alkyl, C_2–C_4-alkoxyalkyl, C_2–C_4-cyanoalkyl, cyclohexyl, benzyl or phenyl, or each pair of substituents (R_1 and R_2) and (R_3 and R_4) together with the nitrogen atom to which said pair is attached represents pyrrolidino, piperidino or morpholino and R_5 and R_6 independently are hydrogen, halogen, methyl, methoxy or ethoxy, Q_1 represents hydrogen, C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl or benzyl, Q_2 represents hydrogen, C_1–C_{12}-alkyl or phenyl, W represents hydroxy, alkoxy, phenyloxy or amino, V represents oxygen, sulphur or imino and T_1 and T_2 independently represent hydrogen, C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, phenyl or benzyl, or T_1 and T_2 together with the nitrogen atom which links them represent pyrrolidino, piperidino, pipecolino, morpholino, thiomorpholino or piperazino.

4,533,500

PROCESS FOR MANUFACTURING N-ACYLIMINODIACETIC ACIDS

Yves Chauvin, Le Pecq; Dominique Commereuc, Meudon; André Hirschauer, Montesson; Dominique Reffet, Rueil-Malmaison, and Robert Stern, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison and Societe Nationale Elf-Aquitaine (Production), Paris La Defense, both of, France

Filed Mar. 17, 1983, Ser. No. 476,295

Claims priority, application France, Mar. 17, 1982, 82 04669

Int. Cl.³ C09F *5/00, 7/00*; C11C *3/00*

U.S. Cl. 260—404 **8 Claims**

1. A process for manufacturing a N-acyliminodiacetic acid by reacting formaldehyde or at least one formaldehyde generator with at least one amide unsubstituted on the nitrogen atom or with at least one generator of an amide unsubstituted on the nitrogen atom and with carbon monoxide, in the presence of a carbonylation catalyst, characterized in that the reaction is performed with a ratio of at least 2:1 of the aldehyde groups or generators thereof to the amide groups or generators thereof.

4,533,501

REFINING

Achintya K. Sen Gupta, Schenefeld, Fed. Rep. of Germany, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 20, 1983, Ser. No. 486,647

Claims priority, application United Kingdom, Apr. 21, 1982, 8211563

Int. Cl.³ C09F *5/10*; C11B *3/00*

U.S. Cl. 260—428 **21 Claims**

1. Improved process for refining lipids by ultrafiltration wherein a liquid organic phase comprising a lipid is separated into permeate and retentate fractions containing separated components of the lipid by contact under sufficient superatmospheric pressure with a semi-permeable ultrafiltration membrane and recovering refined lipid from at least one of said fractions, and wherein the retentate fraction contains a solute impermeable to the memberane for improving separation of the said fractions and the improvement comprising adding an additive selected from the group consisting of shea gum, surfactant, soap and mixtures thereof to the lipid.

4,533,502

PLATINUM (II) COMPOUNDS AND THEIR PREPARATION

Fernande D. Rochon, and Pi-Chang Kong, both of C.P. 8888, Succ. A, Montréal, Canada (H3C 3P8)

Filed Feb. 22, 1983, Ser. No. 468,619

Int. Cl.³ C07F *15/00*

U.S. Cl. 546—8 **10 Claims**

1. A method for the preparation of an oligomer having the emperical formula $[PtLI_2]_x$ where x is a lower integer, 2 or higher and each L is the same and is ammine, a primary or secondary mono amine or a pyridine-type amine, coordinated to the Pt through the amine nitrogen, or dimethylformamide coordinated through the oxygen atom to the platinum which method comprises reacting a compound corresponding to the formula

cis-$[PtL_2I_2]$

where L is as defined above in the presence of a molar excess of a platinum non-reactive aqueous acid in admixture with a water miscible inert solvent for said $[PtL_2I_2]$, thereby forming said oligomer.

4,533,503

ALUMINUM BIS(ALKYLSILOXIDE)ACETOACETONATE

Jeffrey H. Wengrovius, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 520,974, Aug. 8, 1983, Pat. No. 4,489,199. This application Jun. 15, 1984, Ser. No. 621,304

Int. Cl.³ C07F *5/06*

U.S. Cl. 556—173 **4 Claims**

1. An aluminum bis(alkylsiloxide)acetoacetonate selected from the class consisting of aluminum bis(trimethylsiloxide) ethylàcetoacetonate, aluminum bis(dimethoxymethylsiloxide) ethylacetoacetonate and aluminum bis(dimethoxymethylsiloxide) acetylacetonate

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4,533,504

PROCESS FOR THE PREPARATION OF DIARYL CARBONATES

Donald A. Bolon, Scotia; Thomas B. Gorczyca, Schenectady, and John E. Hallgren, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,189

The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.

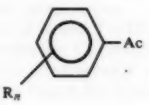
Int. Cl.³ C07C *68/04, 68/06*

U.S. Cl. 260—463 **7 Claims**

1. A process for producing diaryl and substituted diaryl carbonates utilizing phenol and substituted phenols, carbon monoxide and oxygen as raw materials, said process comprising the steps of:

A. reacting an alkanol, carbon monoxide and oxygen to produce a dialkyl carbonate of the formula R'_2CO_3 and water, and removing said water;

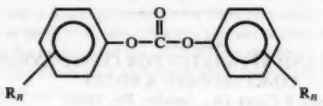
B. reacting said dialkyl carbonate of step A with a phenyl ester of the formula



in the presence of a catalyst having the formula

X_2SnY_2

to produce a diaryl carbonate of the formula



and an alkyl ester of the formula

R'—Ac,

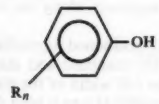
said reaction being carried out at a temperature of 150°–250° C. and a pressure of 100–300 psig;

C. heating said alkyl ester from step B to form a ketene of the formula

$R''_2C{=}C{=}O$

and the alkanol of step A;

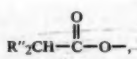
D. forming the phenyl ester of step B by reacting the corresponding phenol of the formula



with the ketene of step C; and

E. recycling the phenyl ester formed in step D to step B and the alkanol formed in step C to step A;

wherein R is independently selected from the class consisting of alkyl, alkoxy, aryl, and aryloxy groups, R' is an alkyl group from the alkanol, each R'' is hydrogen or alkyl, Ac is an acyloxy radical of the formula



X is a C_{1-8} alkyl substituent, either each Y is independently selected from the class consisting of OX, acyloxy and halogen or both Y's are taken together to define oxygen, and n is a whole number from 0 to 3.

4,533,505

PROCESS FOR THE PREPARATION OF STYRENE DERIVATIVES AND/OR STILBENE DERIVATIVES

Alwyn Spencer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 19, 1982, Ser. No. 360,017

Claims priority, application Switzerland, Mar. 31, 1981, 2179/81

Int. Cl.³ C07C *121/50, 1/20, 1/00*

U.S. Cl. 260—465 R **16 Claims**

1. A process for the preparation of compounds of the formula Ia or Ib

$$Z{-}CH{=}CH{-}Z_1 \qquad \text{(Ia)}$$

or

$$CH_2{=}CH{-}Z_2{-}CH{=}CH_2, \qquad \text{(Ib)}$$

in which Z represents unsubstituted or substituted phenyl or naphthyl, Z_1 represents hydrogen or has the same meaning as Z and Z_2 represents unsubstituted or substituted phenylene, naphthylene or p-biphenylene or an unsubstituted or substituted stilbene radical, which comprises reacting ethylene, under a pressure of 0.1 to 20 bar, in the presence of a base and with the addition of palladium metal or palladium compounds which form phosphorus-free labile palladium(O) compounds under the reaction conditions, as a catalyst, with a compound of the formula II or III

Z—COX(II) or XOC—Z_2COX(III)

in which Z and Z_2 have the meanings indicated under formula Ia and Ib, respectively, and X represents chlorine, bromine or iodine.

4,533,506

RESOLUTION OF AMINO ACIDS

Meir Lahav; Lia Addadi, and Isabela Weissbuch, all of Rehovot, Israel, assignors to Yeda Research and Development Company Ltd., Rehovot, Israel

Continuation of Ser. No. 268,804, Jun. 1, 1981, Pat. No. 4,390,722. This application Jan. 3, 1983, Ser. No. 455,333

Claims priority, application Israel, Jun. 8, 1980, 60254

Int. Cl.³ C07B *19/00*

U.S. Cl. 260—501.12 **8 Claims**

1. A process for the resolution of a mixture of D- and L-forms of p-hydroxyphenylglycine p-toluene sulfonate, whereby the ratio of one desired enantiomorph to the other undesired enantiomorph of said p-hydroxyphenylglycine p-toluene sulfonate is increased in the crystalline compound obtained, as compared to the ratio in the starting material, which process comprises:

forming a supersaturated solution of said mixture;

adding, as a crystallization inhibitor, a small amount of another predetermined amino acid having a molecular structure which resembles that of one of the enantiomorphs of said racemic mixture, said crystallization inhibitor being a D-amino acid to inhibit the growing of D-amino acid when the L-amino acid is desired, or an L-amino acid when the D-amino acid is desired; and

crystallizing a portion of the p-hydroxyphenylglycine p-toluene sulfonate from said supersaturated solution.

4,533,507

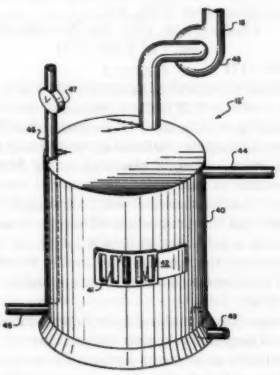
FIBER MOISTURE CONTROL IN THE FORMATION OF DRY-LAID WEBS

Thomas Tao, Neenah, Wis., assignor to James River-Dixie/-Northern, Inc., Conn.

Division of Ser. No. 274,804, Jun. 18, 1981,. This application Aug. 5, 1983, Ser. No. 520,591

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—153 **2 Claims**



1. An apparatus for supplying a stream of unsaturated, moisture-laden air to a defiberizer for use in a process for air-laying fibers to form a web, said apparatus comprising:

a jacketed tank including means for supplying cooling water to the jacket of the tank;

means for supplying ambient air to the interior of said water-jacketed tank;

steam supply means for supplying a controlled amount of saturated steam to the interior of said water-jacketed tank;

means for transporting moisture-laden air from said water-jacketed tank to the defiberizer, the amount of moisture being regulated by both the steam supply means and the cooling water supply means; and

condensate discharge means for removal of condensate from the interior of said tank.

4,533,508

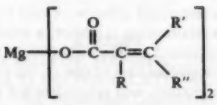
METAL OXIDE FIBERS FROM ACRYLATE SALTS

Rex R. Stevens, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 22, 1983, Ser. No. 525,383
Int. Cl.³ C04B *35/64*
U.S. Cl. 264—22 **9 Claims**

1. A process for the preparation of magnesium oxide fibers, which comprises:

(a) preparing a composition comprising a solution of a polymerization initiator, a water-soluble organic polymer and a magnesium acrylate of the formula:



wherein R, R′ and R″ are independently lower alkyl, inertly substituted lower alkyl, or H, the proportion by weight of the magnesium acrylate being greater than the proportion by weight of the organic polymer;

(b) preparing a green fiber from the composition of (a) and polymerizing the acrylate moieties of the green fiber; and

(c) treating the green fiber under conditions such that the organic matter is removed from the fiber and a magnesium oxide fiber is produced.

4,533,509

LOW COEFFICIENT OF FRICTION FILM STRUCTURE AND METHOD OF FORMING THE SAME

Lawrence J. Gust, Victor; Eileen F. O'Sullivan, Rochester, and Ronald C. Wood, Jr., Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,425
Int. Cl.³ B29D *7/24*
U.S. Cl. 264—171 **11 Claims**

1. A method of preparing a thermoplastic film structure free of organic coefficient of friction reducing agents comprising:

(a) preparing a skin resin of a finely divided, uniformly dispersed inorganic material in an optically clear thermoplastic resin, either in one step or by first preparing a concentrate of said inorganic material in said resin and diluting the concentrate with additional thermoplastic resin so that the proportion of inorganic material in the skin resin is sufficient to impart antiblock characteristics and decrease the inherent film to film coefficient of friction of an oriented film of said thermoplastic resin to about 0.4 or less;

(b) forming either simultaneously or sequentially a composite of a comparatively thin surface layer of the composition of (a) on at least one surface of a comparatively thick base layer of optically clear thermoplastic free of inorganic antiblock agents, and

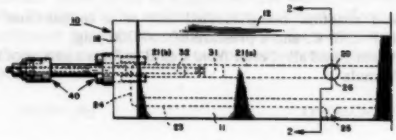
(c) orienting the composite so that the thickness of said surface layer and the proportion of said inorganic material in said surface layer is such that the % haze of the oriented composite is about 3 or less.

4,533,510

METHOD AND APPARATUS FOR CONTINUOUSLY CO-EXTRUDING A SHEET

Frank R. Nissel, 8 Carey Dr., Ambler, Pa. 19002

Filed Sep. 19, 1983, Ser. No. 533,433
Int. Cl.³ B29F *3/04*
U.S. Cl. 264—171 **11 Claims**



1. A manifold sheet extrusion die for continuously producing a sheet composed of a plurality of materials coextruded in at least three segments, one such segment being a body segment and two other segments being edge segments, along the width of the sheet, comprising:

a. a lateral distribution manifold positioned immediately upstream of an extrusion slit, the manifold and the slit extending along substantially the full width of the die;

b. dividing means for dividing the manifold into at least three sections along the length of the manifold and for precisely controlling the width of a sheet segment, one such section being a body section and two other sections being edge sections, the dividing means being substantially infinitely adjustable along the length of the manifold;

c. first feeding means for feeding a first material in a flowable state to an edge section; and

d. second feeding means for feeding a second material in a flowable state to the body section.

8. A method for continuously producing a sheet composed of a plurality of materials coextruded in at least three segments, one such segment being a body segment and two other segments being edge segments, along the width of the sheet, comprising:

a. dividing a lateral distribution manifold positioned immediately upstream of an extrusion slit, the manifold and the slit extending along substantially the full width of the die, into at least three sections, one such section being a body section and two other sections being edge sections, along the length of the manifold;

b. feeding a first material in a flowable state to the body section;

c. feeding a second material in a flowable state to the edge section; and

d. precisely controlling the widths of the manifold sections with substantially infinitely adjustable flow dividing means positioned within the manifold in order to precisely control the widths of the extruded sheet segments.

4,533,511

PRODUCTION OF SYNTHETIC FIBERS

Hermann Mark, Brooklyn, N.Y., assignor to Isovolta Osterreichische Isolierstoffwerke, Wiener Neudorf, Austria

Filed Dec. 14, 1979, Ser. No. 103,585
Claims priority, application Austria, Dec. 20, 1978, 91151/78
Int. Cl.³ D01D *5/06*
U.S. Cl. 264—184 **4 Claims**

1. A process for the spinning of synthetic fibers comprising dissolving at least one polycondensation product of at least one polyfunctional phenol component with the phenolic groups attached to a central carbon atom so they are hindered in their free rotation and at least one polyfunctional carboxylic acid having an inherent viscosity η inh greater than 0.5 dl/g in a

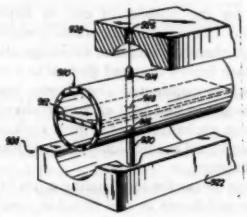
solvent with a boiling point less than 100° C. to form a spinning solution, forcing the spinning solution through spinning nozzles into a liquid precipitant for fiber formation at a temperature at least 8° C. less than the solvent boiling point to withdraw the majority of the solvent from the fibers, stretching the resulting fibers to 2 to 6 times their length and removing the residual solvent.

4,533,512

METHOD AND APPARATUS FOR BENDING MULTIPLE CHANNEL TUBING

Murray Altman, Fort Lee, and Gerald J. Bellasalma, West Caldwell, both of N.J., assignors to Thermasol, Ltd., Leonia, N.J.

Division of Ser. No. 5,377, Jan. 22, 1979, Pat. No. 4,240,166. This application Oct. 6, 1980, Ser. No. 194,356
Int. Cl.³ B29C *17/02*
U.S. Cl. 264—339 **19 Claims**



1. A method of manufacturing a liquid distribution network for a whirlpool system from a continuous piece of thermoplastic, multiple channel tubing, which includes at least a pair of channels separated by a partition, comprising the steps of providing a plurality of holes through said tubing, including said partition, at predetermined locations along the length of said tubing, said predetermined locations corresponding to sites where whirlpool jets will be attached to said tubing; softening said tubing to an extent such that said tubing is bendable; inserting a peg through each of said holes in said tubing; clamping said tubing in the vicinity of each of said holes therein; and bending said softened tubing into a desired configuration which substantially matches the outer contour of a water receptacle.

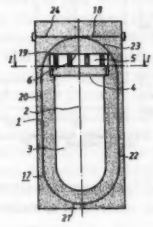
19. Apparatus useful in bending softened multiple channel tubing having a predetermined cross-sectional shape and a partition of a predetermined shape which separates the tubing into a multiplicity of channels, comprising maintaining means for maintaining the cross-sectional shape of a section of the softened tubing and for maintaining the shape of the partition and its proper orientation with respect to the rest of the tubing, said maintaining means including a first saddle clamp member positioned on one side of the tubing and a second saddle clamp member positioned on an opposite side of the tubing, said first and second saddle clamp members having surfaces with a contour which substantially matches at least a portion of the cross-sectional shape of the tubing, and a peg attached to and extending from said first saddle clamp member to said second saddle clamp member through one hole provided in said second saddle clamp member and another hole provided in the tubing, including its partition, whereby said peg cooperates with said first and second saddle clamp members to maintain the shape of the partition and its proper orientation with respect to the rest of the tubing.

4,533,513

ENCLOSING MEANS FOR HOUSING A NUCLEAR REACTOR CORE

Hans Norman, Västerås, Sweden, assignor to AB Asea-Atom, Västerås, Sweden

Filed Dec. 20, 1983, Ser. No. 563,428
Claims priority, application Sweden, Mar. 15, 1983, 8301400
Int. Cl.³ G21C *13/06*; F16J *13/00*
U.S. Cl. 376—260 **5 Claims**



1. In a water cooled nuclear reactor having a core and an enclosing means housing said core, said enclosing means comprising an elongated concrete body and a pressure chamber within said concrete body, said pressure chamber being substantially defined by a solid of revolution about a vertical, longitudinal axis of rotation, said pressure chamber having an opening directed to the axial direction and a cover arranged at said opening so as to give a pressure-tight sealing of said pressure chamber, said pressure chamber constituting only part of a larger cavity within said concrete body, said cavity in addition to said pressure chamber comprising a space located above said opening and connected with the outside of said concrete body by means of at least one transversal tunnel provided in said concrete body, said enclosing means being further characterized in that said space is defined in an upwards direction by means of a transversely extending limiting surface belonging to an integral portion of said concrete body, in that most of said limiting surface is disposed vertically above said cover, in that a gap extends vertically between said limiting surface and said cover, in that a plurality of compressive-force transmitting elements are arranged so as to bridge said gap, in that said cover is arranged relative to said space and dimensioned so as to be removable from said opening for maintenance of equipment associated with said core, and in that said at least one tunnel is dimensioned to permit transport of said cover through said tunnel upon removal of said cover from said opening.

4,533,514

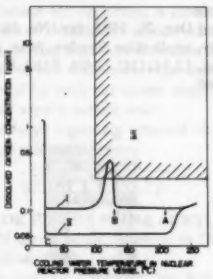
NUCLEAR REACTOR DEGASSING METHOD AND DEGASSING SYSTEM

Michiyoshi Yamamoto; Katsumi Ohsumi; Shinji Mitani; Yoshie Takashima, and Hiroo Igarashi, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,886
Claims priority, application Japan, Oct. 17, 1980, 55-144329
Int. Cl.³ G21C *19/32*
U.S. Cl. 376—308 **16 Claims**

1. A system for degassing a nuclear reactor comprising a nuclear reactor vessel containing a coolant with a concentration of gas therein, the coolant being in a hot temperature state during operation of the nuclear reactor, means for recirculating the coolant in the reactor vessel, means for extracting at least part of the coolant in the recirculating means, means for spraying the extracted coolant during shutdown when the coolant temperature is in at least a range between 130° C. and 100° C. into a space of the nuclear reactor vessel for separating

the gas from the coolant, and means for extracting the gas in the space of the nuclear reactor vessel so as to degasify the



nuclear reactor vessel for preventing stress corrosion cracking of the nuclear reactor vessel and associated equipment.

4,533,515

METHOD EMPLOYING STEAM TO STERILIZE PACKAGING MATERIAL

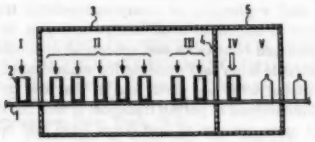
Karl-Theo Witter; Peter Friedrich, both of Linnich, and Ulrich Ströle, Titz, all of Fed. Rep. of Germany, assignors to Papier- und Kunststoff-Werke Linnich GmbH, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 322,121, Nov. 17, 1981, abandoned. This application Mar. 22, 1984, Ser. No. 592,727

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 3044061

Int. Cl.³ E04B *2/00*

U.S. Cl. 422—26 **4 Claims**



1. In the steam sterilization of packaging material, such as blanks intended for containers of acid liquids, the improvement which comprises employing a packaging material with a surface germ-count of less than approximately 1 germ/dm^2, forming the packaging material with a surface germ-count of less than approximately 1 germ/dm^2 into open containers, preheating the surfaces of the containers to 60° to 80° C. with air at 100° to 200° C., placing the containers into a sterile space after preheating, completing sterilization in the sterile space by treating the containers solely with steam at atmospheric pressure for 3 to 10 seconds including blowing the steam into the container in a sequence of five cycles of one to two seconds each in volumes of at least ten times that of the container and forming by condensation a thin film of water on the inner surface of the container that is as continuous as possible and that has a temperature of 90° to 100° C., drying the sterilized containers in the sterile space with sterile hot air at 150°–200° C. and filling the completely sterilized containers in a separate space and sealing the filled containers.

4,533,516

APPARATUS FOR THE TRANSFER OF ONE OR MORE SUBSTANCES BETWEEN A GAS AND A LIQUID

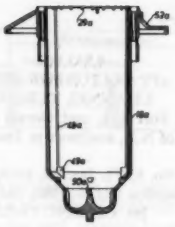
Bo A. Johnsson, Landskrona; Ingvar E. Loseli; Sune H. Palmqvist, and Kaj O. Stenberg, all of Staffanstorp, all of Sweden, assignors to Gambro Cardio AB, Sweden

Filed Jul. 6, 1982, Ser. No. 395,283

Claims priority, application Sweden, Jul. 7, 1981, 8104219

Int. Cl.³ A61M *1/03*

U.S. Cl. 422—46 **14 Claims**



1. Apparatus for the transfer of one or more substances between a gas and a liquid, said apparatus comprising:

a heat exchange chamber, said heat exchange chamber defining a flow path from a first end thereof to a second end at which liquid is conducted therefrom, heat exchange means supported in said heat exchange chamber for conducting a heat exchange fluid in heat exchange relationship with said liquid as said liquid flows through said heat exchange chamber;

gas introduction means for introducing a gas in the form of bubbles into said liquid as said liquid is conducted along said flow path to thereby effect transfer of substances between said gas and said liquid, said gas introduction means being located upstream of said second end of said heat exchange chamber;

a cover having an inner surface disposed adjacent said second end of said heat exchange chamber, said second end of said heat exchange chamber being defined by a peripheral edge portion of a wall, and recesses in said peripheral edge portion of said wall cooperating with said inner surface of said cover to provide a plurality of throttling ports for conducting liquid from said heat exchange chamber, said recesses being arranged about the periphery of said heat exchange chamber; and

removal means alons said flow path downstream of second end of said heat exchange chamber for removing excess gas from said liquid together with any substances transferred from said liquid to said gas.

4,533,517

CONTROL OF A POLYMERIZATION REACTION

James A. Hofferber, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 1, 1982, Ser. No. 394,089

Int. Cl.³ B01J *8/08, 31/08*

U.S. Cl. 422—62 **4 Claims**

1. Apparatus comprising:

a polymerization reactor;

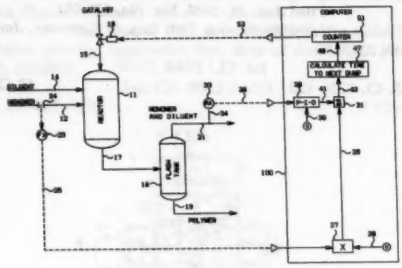
means for providing monomer to said polymerization reactor;

a catalyst feeder valve for periodically introducing catalyst into said polymerization reactor;

means for removing the reaction effluent containing polymer and unreacted monomer from said polymerization reactor;

means for establishing a first signal representative of the time which should elapse until the next actuation of said catalyst feeder valve in order to maintain a desired concentra-

tion of unreacted monomer in the reaction effluent withdrawn from said polymerization reactor, wherein actuation of said catalyst feeder valve introduces a predetermined volume of catalyst into said polymerization reactor



and wherein said first signal is established in part in response to the actual unreacted monomer concentration; and

means for actuating said catalyst feeder valve when the time represented by said first signal has elapsed.

4,533,518

APPARATUS FOR ANALYSIS OF ANIONS

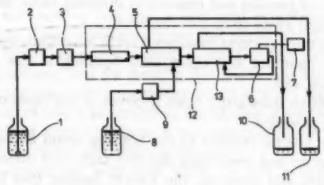
Yuzuru Hanaoka; Takeshi Murayama; Setsuo Muramoto, and Tamizo Matsuura, all of Tokyo, Japan, assignors to Kokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Jun. 7, 1982, Ser. No. 385,570

Claims priority, application Japan, Feb. 5, 1982, 57-17121

Int. Cl.³ G01N *31/04, 31/08;* B01D *13/00*

U.S. Cl. 422—70 **2 Claims**



1. In an apparatus for analysis of an anion comprising sample injection means for collecting a prescribed amount of a sample solution containing an anion;

a separation column connected to said sample injection means, packed with an anion exchange resin and adapted to separate said anion contained in said sample solution, said sample solution being introduced into said separation column along with an eluant solution by said sample injection means;

a source of scavenger solution of a prescribed solvent;

decationizer means connected to said separation column and to said source of scavenger solution and comprising a first compartment, a second compartment, and a wall therebetween, means connecting said first compartment to said separation column for receiving and passing an effluent solution from said separation column through said first compartment, means connecting said second compartment to said source of scavenger solution for receiving and passing said scavenger solution from said source of scavenger solution through said second compartment, said wall of said decationizer means being of a cation exchange composition and serving as a medium for exchange between a cation in said effluent solution and a cation in said scavenger solution; and

detector means for measuring the conductivity of said effluent solution; the improvement comprising

water dip effect removing means disposed between and connected to said detector means and said decationizer means and comprising a third compartment, a fourth compartment, and a wall therebetween, means connecting said third compartment to said first compartment of said decationizer means for receiving and passing said effluent solution from said first compartment through said third compartment, means connecting said detector means to said third compartment of said water dip effect removing means for receiving and passing said effluent solution from said third compartment through said detector means, means connecting said fourth compartment to said detector means for receiving and passing said effluent solution from said detector means through said fourth compartment of said water dip effect removing means, and said wall of said water dip effect removing means comprising a member pervious to carbon dioxide gas or to carbonic acid and impervious to anions, whereby said water dip effect removing means substantially removes the impact of the water dip effect of water on conductivity of said effluent solution as measured by said detector means.

4,533,519

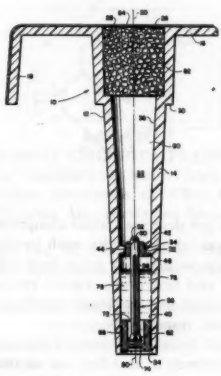
GAS FLOW COAGULATION TEST CARTRIDGE HAVING MOVABLE MEMBER ESTABLISHING COMMUNICATION BETWEEN REAGENT AND REACTION CHAMBERS

Robert F. Baugh, Aurora; Walter J. Braun, Englewood, and Daniel Cooper, Parker, all of Colo., assignors to HemoTec, Inc., Englewood, Colo.

Filed Jul. 20, 1983, Ser. No. 515,914

Int. Cl.³ G01N *33/16*

U.S. Cl. 422—73 **22 Claims**



1. In a cartridge in which to conduct a coagulation-related test on fluid, having a reaction chamber into which the fluid is inserted for the test and also having a reagent chamber containing reagent to be mixed with the fluid in the reaction chamber at the time of the test by transferring the reagent from the reagent chamber to the reaction chamber at the commencement of the test, an improved means for sealing the reagent in the reagent chamber prior to the test and for opening the reagent chamber and reaction chamber for communication of the reagent therebetween at the commencement of the test, comprising in combination:

separating means for separating the reagent and reaction chambers and for defining a communication opening therethrough between the chambers, and

an elongated pin member longitudinally movably retained

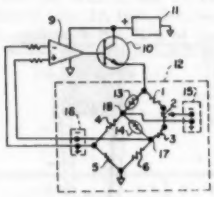
within the communication opening, and having a first portion initially positioned within the communication opening and of an operative configuration for sealing the communication opening when positioned therein, and also having a second portion longitudinally displaced along the pin member from the first portion and of an operative configuration for opening the communication opening to fluid communication therethrough upon longitudinal movement of said pin member positioning the first portion out of the communication opening at the commencement of the test.

4,533,520

CIRCUIT FOR CONSTANT TEMPERATURE OPERATION OF A CATALYTIC COMBUSTIBLE GAS DETECTOR

Clayton J. Bossart, Monroeville, and Thomas C. Fatur, Delmont, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jul. 2, 1984, Ser. No. 627,302
Int. Cl.³ G01N *27/16*
U.S. Cl. 422—96 **7 Claims**



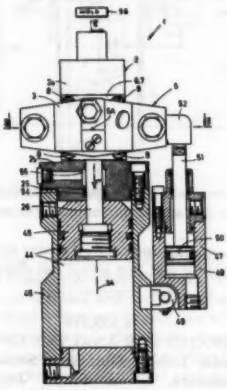
1. A catalytic gas detector circuit comprising:
first and second bridge circuits, each having input and output terminals wherein an input terminal and an output terminal of said first bridge circuit are common with an output terminal and an input terminal of said second bridge circuit, respectively;
a resistive gas detector element connected between the common terminals of said first and second bridge circuit;
at least three separate impedances which are not common to both bridge circuits contained in each of said first and second bridge circuits, wherein one of said separate impedances in said first bridge circuit is a resistive compensating element which is located in series with said resistive gas detector;
means for deriving a signal indicative of gas concentration from across the output terminals of said first bridge circuit;
a source of potential for powering said bridge circuits;
a control element for varying the flow of current from said source of potential to said bridge circuits;
and means coupled to the output terminals of said second bridge circuit for controlling said control element to maintain the effective resistance of said resistive gas detector element essentially constant.

4,533,521

MIXING NOZZLE FOR TWO REACTANT COMPONENTS

Norbert Feist, Hilchenbach, Fed. Rep. of Germany, assignor to Battenfeld Maschinenfabrik GmbH, Meinerzhagen, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,054
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323366
Int. Cl.³ F04B *23/00*
U.S. Cl. 422—133 **12 Claims**



1. A mixing and extruding nozzle for two reactant components, the nozzle comprising:
a housing formed with
a mixing chamber,
a pair of parallel and oppositely directed faces flanking and turned away from the chamber,
respective injection passages having inner ends opening into the chamber and outer ends opening at the respective faces, and
respective outwardly open grooves in the faces offset from the passages;
a rocker pivotal relative to the housing about an axis perpendicular to and traversing the two faces and offset from the passages and grooves, the rocker having two like halves each formed with
a face confronting the respective housing face and
a feed passage opening at the respective rocker face offset from the axis, the rocker being pivotal about the axis relative to the housing between
a feed position with the feed passages aligned with the respective injection passages and opening therethrough into the chamber and
a return position with the feed passages out of alignment with the respective injection passages and communicating through the respective grooves with the respective return passages;
respective supply means for feeding the respective components separately under pressure to the respective feed passages and for withdrawing the respective components from the respective return passages;
respective seal rings engaged between the rocker halves and the housing; and
means for relatively pivoting the rocker and housing between the positions, whereby in the feed position the components pass from the respective feed passages through the respective injection passages into the chamber and in the return position the components flow from the feed passages through the respective grooves into the respective return passages.

4,533,522
APPARATUS FOR THE DESULFURIZATION OF FLUE GASES

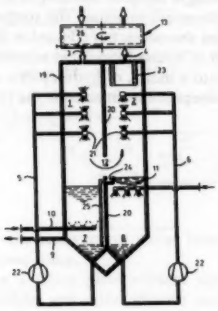
Jürgen Leimkühler, Essen, Fed. Rep. of Germany, assignor to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserrückkühlanlagen GmbH & Co. Kommanditgesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,614

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1982, 3236905

Int. Cl.³ B01J *10/00*

U.S. Cl. 422—170 **5 Claims**



1. An apparatus for desulfurizing a flue gas from fossil fuel combustion, comprising:

means forming an acid scrubbing column having a sump and a basic scrubbing column in side by side relation with a flue gas inlet to said acid scrubbing column and a flue gas outlet from said basic scrubbing column disposed in side by side relationship in a common plane above said columns;

means for treating flue gas in said acid scrubbing column with an acidic scrubbing liquid, for permitting flue gas to pass from said acid scrubbing column to said basic scrubbing column, and for treating flue gas in said basic scrubbing column with a scrubbing liquid at a pH higher than the pH of said acid scrubbing liquid, one of said scrubbing liquids at least containing a calcium compound whereby calcium sulfate dihydrate is formed;

means connected with said sump of said acid-scrubbing column for admitting an oxygen-containing gas thereto and for removing calcium sulfate dihydrate therefrom;

a regenerative heat exchanger having a rotating heat storage mass disposed at said plane above said columns and positioned so that said mass is heated by incoming flue gas admitted to said acid column and heats flue gas discharged from said basic column upon rotation of said mass from alignment with said inlet into alignment with said outlet; and

means in said heat exchanger for rinsing deposits from said mass with said acid scrubbing liquid above said acidic scrubbing column.

4,533,523
CORONA TREATER FOR PLASTIC FILM

Andreas Ahlbrandt, 17 Uhlandstrasse, Lauterbach, Fed. Rep. of Germany

Filed Jan. 9, 1984, Ser. No. 569,264

Int. Cl.³ B01J *19/08*; **B29C** *25/00*

U.S. Cl. 422—186.05 **11 Claims**

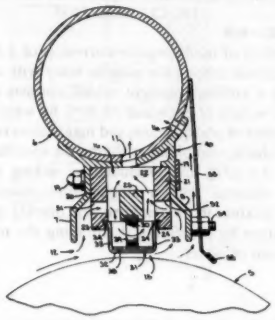
1. A corona treater which comprises:

a first conductive electrode for supporting a material to be treated in a treatment zone;

a frame;

a conductive electrode bar which is supported by the frame and which extends along the length of the first conductive electrode and is spaced therefrom;

a track supported by the frame and formed from an electrically insulating material, the track extending along the length of the conductive electrode bar and being positioned adjacent thereto; and



an electrode element slidably mounted to the track and having a brush contact which engages and makes electrical connection with the conductive electrode bar;

wherein the electrode element is positioned along the track over the material to be treated to provide an active discharge surface at a desired location.

4,533,524
POLYVINYL CHLORIDE PLASTISOLS

Christian Burba, Ascheberg-Herbern; Ulrich Goeke, Luenen, and Norbert Esper, Bergkamen, all of Fed. Rep. of Germany, assignors to Schering AG., Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,889

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201265

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.³ C08L *77/00, 63/00, 61/00*

U.S. Cl. 427—372.2 **9 Claims**

1. A platisol comprising a polymer of vinyl chloride, a plasticizer therefor, a filler, and from 0.5 to 5 pervent, by weight of said plastisol, of an adhesion promoter which is the condensation production formed between (A) a polyaminoamide which is, in turn, the reaction product of a polymerized fatty acid and an excess, based on carboxyl groups, of a polyalkylene polyamine, and (B) from 3 to 20 percent, by weight of the fatty acid present in said polyaminoamide, of a carboxylic acid or ester of the formula

$$R^1—(COOR^2)_n,$$

wherein R^1 is an optionally substituted saturated or unsaturated aliphatic, araliphatic, or aromatic hydrocarbon having 2 to 18 carbon atoms, R^2 is hydrogen or alkyl having from 1 to 8 carbon atoms, and n is 1 or 2.

4,533,525

METHOD FOR INHIBITING CORROSION OF METAL

Hiroshi Minamide, Sagamihara; Takashi Shintani, Yokohama, and Hiroshi Murayama, Tokyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Division of Ser. No. 242,546, Mar. 11, 1981, abandoned. This application Sep. 19, 1983, Ser. No. 533,695
Claims priority, application Japan, Mar. 12, 1980, 55-030289
Int. Cl.³ B32B 9/00
U.S. Cl. 428—469 2 Claims

1. A method of inhibiting the corrosion of a metallic body which comprises coating the metallic body with a composition comprising a vitrified pigment which consists essentially of 15–80% by weight of P_2O_5 and 20–80% by weight of MgO in terms of oxides of phosphorous and magnesium respectively in a suitable vehicle, said pigment having the specific surface area of at least 0.1 m^2/g and produced by mixing a phosphorus containing material with a magnesium-containing material, heating the mixture to molten form, and quickly quenching the molten mixture by projection or spraying the mixture into a jetting current of water.

4,533,526

PROCESS FOR RECOVERING POLYMETAL COMPOUNDS DISCHARGED FROM A SUBMARINE HYDROTHERMAL SOURCE AND DEVICES FOR CARRYING OUT THE SAME

Jacques Delacour, Paris; Emile Levallois, Courbevoie; Patrick Antier, Niort, and Francois-Xavier Saint Martin, Epinal, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 21, 1982, Ser. No. 451,674
Claims priority, application France, Dec. 21, 1981, 81 24049
Int. Cl.³ C01B 17/20
U.S. Cl. 423—1 10 Claims

1. A process for recovering polymetal compounds comprising metal sulfides discharged from a submarine hydrothermal source, comprising withdrawing hydrothermal fluid in the immediate vicinity of the mouth of said hydrothermal source, thereby avoiding substantial interaction with surrounding sea water to maintain the initial concentration of polymetal compounds, concentrating polymetal compounds, at a location underwater in the so-withdrawn fluid, and raising to the surface of the water a fluid enriched with polymetal compounds.

4,533,527

TUNGSTEN RECOVERY FROM CARBIDES

George Farrell, Northwich; Diana M. Anderson, Runcorn, and Michael E. Walton, Stockport, all of England, assignors to Interox Chemicals Limited, London, England

Filed Aug. 17, 1983, Ser. No. 523,956
Claims priority, application United Kingdom, Sep. 4, 1982, 8225261
Int. Cl.³ C01G 41/00
U.S. Cl. 423—53 8 Claims

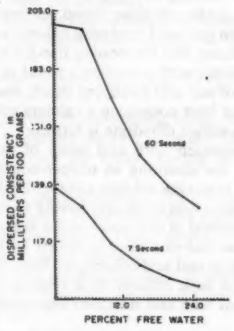
1. In a process for the recovery of tungsten from tungsten carbide in which tungsten carbide is contacted with excess hydrogen peroxide in aqueous solution to solubilize tungsten values the improvement in which the tungsten carbide is in powder form and the contact is effected in the presence of a catalytic amount of hydrochloric acid selected in the range of from 0.05 moles to 4 moles, of hydrochloric acid per mole of tungsten at a temperature maintained in the range of 55° to 85° C.

4,533,528

PROCESS FOR CONTINUOUSLY CALCINING GYPSUM TO LOW DISPERSED CONSISTENCY STUCCO

Michael F. Zaskalicky, Lutherville, Md., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jul. 15, 1983, Ser. No. 514,175
Int. Cl.³ C04B 11/00
U.S. Cl. 423—171 9 Claims



1. The process for continuously calcining gypsum to beta hemihydrate which consists essentially of initially charging a continuous atmospheric pressure kettle calciner with gypsum; heating the gypsum in the kettle to the required calcining and fluidizing temperature to cause the gypsum to calcine to beta hemihydrate; and

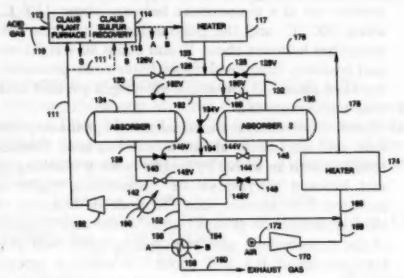
when the gypsum in the kettle has calcined to beta hemihydrate and been withdrawn from the kettle, adding a substantially continuous stream of wet gypsum to the upper strata of the mass in the kettle and withdrawing a substantially continuous stream of beta hemihydrate having a lower dispersed consistency than the initials discharge of hemihydrate,

the wet gypsum containing from about 5 to about 40% by weight of associated free water.

4,533,529
SULFUR RECOVERY PROCESS

Min-Hsiun Lee, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Filed Oct. 21, 1983, Ser. No. 544,335
Int. Cl.[3] B01D *53/36*
U.S. Cl. 423—230 32 Claims



1. Process for the recovery of sulfur from a Claus plant effluent stream comprising:

(a) introducing a Claus plant effluent stream containing hydrogen sulfide, and sulfur dioxide and water into an absorber zone comprising a zinc oxide sorbent, sufficient reducing equivalents being present in the thus introduced stream for converting substantially all sulfur compounds present to hydrogen sulfide;

(b) reacting hydrogen sulfide and sulfur dioxide in the presence of said reducing equivalents and of the zinc oxide sorbent in the absorber zone at a temperature effective for removing hydrogen sulfide and sulfur dioxide from the Claus plant effluent stream and removing hydrogen sulfide and sulfur dioxide from the Claus plant effluent stream in the presence of the zinc oxide sorbent and producing a laden sorbent and an absorber zone effluent stream of reduced sulfur compound content; and

(c) regenerating the laden sorbent by passing an oxygen containing gas in contact therewith and producing a regenerated sorbent and a regeneration effluent stream containing at least one of elemental sulfur and sulfur dioxide.

4,533,530
PROCESS FOR THE SEPARATION OF VOLATILE CHLORINE COMPOUNDS FROM THE EXHAUST GASES RESULTING FROM THE CHLORINATION OF TITANIUM-CONTAINING RAW MATERIALS

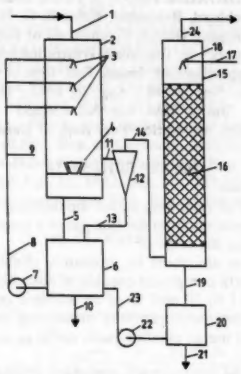
Achim Hartmann, Pulheim, Fed. Rep. of Germany, assignor to Kronos Titan, GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1984, Ser. No. 639,215
Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328675
Int. Cl.[3] B01D *53/34;* C01C *17/03*
U.S. Cl. 423—240 18 Claims

1. A process for the separation of volatile chlorine compounds from the exhaust gases resulting from the chlorination of titanium-containing raw materials comprising:

(a) contacting the exhaust gases in a first absorption stage with an aqueous solution of titanium oxide chloride having a concentration, calculated as titanium dioxide, in the range of from 100 to 170 g TiO_2/l; and

(b) subsequently contacting the exhaust gases in a second absorption stage with water in a volume adequate to absorb

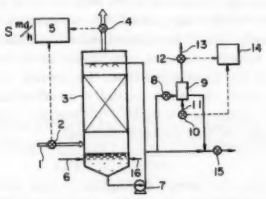


hydrogen chloride and convert it into hydrochloric acid having a concentration of 27 to 32% by weight HCl.

4,533,531
EXHAUST FUME DESULFURIZATION PROCESS

Naoharu Shinoda; Atsushi Tatani; Naohiko Ukawa, and Susumu Okino, all of Hiroshima, Japan, assignors to Mitsubishi Jokogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,137
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—242 12 Claims



1. An exhaust fume desulfurization process which comprises the steps of:

contacting an off-gas containing SO_2 with a slurry containing calcium and manganese compounds;

introducing a gas containing oxygen into said slurry;

detecting the amount of the absorption of oxygen by said slurry;

regulating the amount of manganese present in the slurry based upon the amount of oxygen absorbed by said slurry whereby the desulfurization rate is correspondingly adjusted; and

recovering the desulfurized gas product.

4,533,532

CARBOXYLIC ACID ACTIVATED DRY CALCIUM ABSORBENT METHOD FOR REMOVING SULFUR DIOXIDE FROM A FLUE GAS

Georg R. U. Gebhard, Reichshof; Klaus R. G. Hein, Bergheim-Ahe, and Wolfgang Glaser, Frechen, all of Fed. Rep. of Germany, assignors to Rheinisch-Westfallisches Elektrizitatswerk Aktiengesellschaft, Essen, Fed. Rep. of Germany

Division of Ser. No. 526,907, Aug. 26, 1983,. This application Jul. 2, 1984, Ser. No. 626,652

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1982, 3232081

Int. Cl.[3] B01D *53/34*

U.S. Cl. 423—244 5 Claims

1. A method of removing sulfur dioxide and other noxious and toxic components from the flue gas of a power plant boiler which comprises the steps of:

(a) forming an absorbent by intimately mixing at least one alkaline-earth compound capable of absorbing sulfur dioxide with 0.1 to 10 mol % of an additive consisting of at least one absorbent-reactivity promoting carboxylic acid or an alkali metal, alkaline-earth metal or ammonium salt thereof;

(b) forming the flue gas by combustion of a fuel in a power plant boiler;

(c) contacting the flue gas after its formation in said boiler at an elevated temperature with absorbent formed in step (a) in a dry state and added to said flue gas independently of said combustion; and

(d) dry separating the absorbent after it has contacted the flue gas in step (c) from the remainder of the flue gas.

4,533,533

CONTROLLED DEALUMINATION OF ZEOLITES

John Dewing, Chester; Philip J. Hogan, and Allan Stewart, both of Cheshire, all of England, assignors to Imperial Chemical Industries, PLC, Great Britain

Filed May 23, 1983, Ser. No. 497,227

Claims priority, application United Kingdom, May 27, 1982, 8215531

Int. Cl.[3] C01B *33/26;* B01J *29/06*

U.S. Cl. 423—328 12 Claims

1. A process for the controlled removal of aluminium from a crystalline aluminosilicate zeolite which comprises:

(a) subjecting the zeolite to a treatment whereby the pore system of the zeolite is filled substantially completely with a foreign material;

(b) selectively removing a portion of said foreign material from an outer zone of the zeolite crystal structure;

(c) contacting the zeolite from step (b) with a dealuminating agent to which the said foreign material is substantially inert under the process conditions for a sufficient time and under suitable process conditions as to remove at least some of the aluminium from the zeolite; and

(d) subjecting the thus partially de-aluminated zeolite to further treatment whereby to remove substantially the remainder of said foreign material.

4,533,534

THERMOSETTING COATING COMPOSITION USEFUL AS PRIMER AND CHIP RESISTANT PRIMER II

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Fraser, and Dennis J. Grebur, Berkley, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 510,799, Jul. 5, 1983,. This application Dec. 22, 1983, Ser. No. 564,144

Int. Cl.[3] C08L *63/02, 67/04*

U.S. Cl. 523—436 24 Claims

1. A novel, organic solvent based, thermosetting coating composition comprising:

I. Epoxy-polyester graft copolymer having a number average molecular weight (Mn) of between about 2,000 and about 20,000, said copolymer being prepared by polymerization of lactone monomers in the presence of hydroxy functional epoxy ester resin precursor having a number average molecular weight (Mn) of between about 1,000 and about 4,000 and being formed by reacting diepoxide, which has been chain extended with dicarboxylic acid, with hydroxy functional secondary amine in chain terminating reaction in approximately 1 to 1 equivalent ratio wherein said polymerization of said lactone monomers is carried out at a temperature between about 130° C. and about 200° C. and the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy functional epoxy ester resin precursor and between about 20 and about 90 weight percent said lactone monomers; and

II. Blocked polyisocyanate crosslinking agent comprising at least one isocyanate group which has been blocked by reaction with an active hydrogen bearing blocking agent, said blocked polyisocyanate crosslinking agent being included in an amount such that upon de-blocking of the blocked isocyanate groups thereof at the cure temperature of the composition, said crosslinking agent will provide between about 0.5 and about 1.6 reactive isocyanate groups per reactive group on said epoxy-polyester graft copolymer.

4,533,535

STARTING PITCHES FOR CARBON FIBERS

Seiichi Uemura, Tokyo; Shunichi Yamamoto; Takao Hirose, both of Kamakura; Hiroaki Takashima, Kawasaki, and Osamu Katoh, Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 579,206

Claims priority, application Japan, Feb. 14, 1983, 58-21622

Int. Cl.[3] D01F *9/12;* C10C *3/02*

U.S. Cl. 423—447.4 1 Claim

1. In the process of preparation of carbon fibers wherein a precursor pitch is melt spun, infusibilized, carbonized or graphitized, the improvement which comprises:

(a) in a first step, mixing 100 parts by volume of a heavy oil fraction (1) boiling at a temperature of 200°–550° C. obtained at the time of fluidized catalytic cracking of petroleum with 10–200 parts of volume of a recycled oil (2) boiling in the range of 250°–550° C., said recycled oil (2) being obtained by distilling under reduced pressure a fraction distilled in the following step (c) of producing said precursor pitch by heat treating said starting pitch obtained in step (b),

(b) in a second step, heating said mixture of the fraction (1) and recycled oil (2) at a temperature of from 370° C. to 480° C. under a pressure of from 2 to 50 $Kg/cm^2.G$ to obtain said starting pitch,

(c) in a third step, heating the thus obtained starting pitch at a temperature of 340°–450° C. under atmospheric or reduced pressure to obtain said precursor pitch.

4,533,536

PROCESS FOR THE MANUFACTURE OF POTASSIUM SULPHATE BY TREATING SOLUTIONS CONTAINING MAGNESIUM CHLORIDE AND POTASSIUM CHLORIDE

Michel Bichara, Mulhouse; Emile Wendling, Morshwiller le Bas, and Michel Bodu, Mulhouse, all of France, assignors to Mines de Potasse d'Alsace S.A., Mulhouse, France

Filed Mar. 11, 1983, Ser. No. 474,362

Claims priority, application France, Mar. 11, 1982, 82 04078

Int. Cl.[3] C01D *5/06;* C01B *17/96;* C01F *5/34*

U.S. Cl. 423—551 6 Claims

1. In a process for the production of schoenite from an equilibrium mother liquor obtained from a process of treating carnallite to precipitate synthetic sylvinite, said equilibrium mother liquor consisting essentially of saturation quantities of potassium chloride and sodium chloride, a substantial-satura-

tion quantity of magnesium chloride, and magnesium sulphate, wherein the schoenite is precipitated from said equilibrium mother liquor, the improvement which comprises in a first step adding sodium sulphate to said equilibrium mother liquor to form a precipitate containing mainly sodium chloride; separating said precipitate of sodium chloride from the resultant mother liquor; and in a second step adding potassium chloride to said resultant mother liquor to form a precipitate containing mainly schoenite.

4,533,537
PROCESS OF PRODUCING SULFURIC ACID

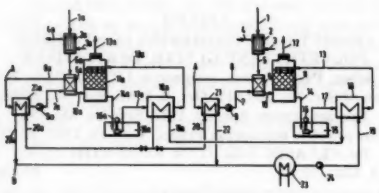
Heinz Dittmar, Friedberg; Manfred Beckmann, New Isenburg; Karl-Heinz Dörr, Mainz; Ulrich Rothe, Frankfurt am Main, and Ulrich Sander, Friedrichsdorf, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 3, 1983, Ser. No. 519,958

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3230003; Sep. 1, 1982, 3232446

Int. Cl.³ C01B *17/82, 17/74*

U.S. Cl. 423—522 **20 Claims**



1. A process for producing sulfuric acid from SO_2-containing gases comprising catalytically reacting SO_2 to SO_3, cooling the SO_3-containing gases in multi-stages and thereafter absorbing SO_3 in concentrated sulfuric acid which is circulated through an absorber to which said SO_3-containing gases are fed, comprising the following steps:

(a) initially cooling the SO_3-containing gases before entering the absorber by an indirect heat exchange,

(b) subsequently cooling the gases of step (a) to a temperature slightly above the dew point temperature of the SO_3-containing gases by an indirect heat exchange with a first cooling fluid (A), which is conducted in a closed cycle,

(c) cooling the sulfuric acid circulating through said absorber by an indirect heat exchange with a second liquid cooling fluid (B), which is conducted in a second closed cycle,

(d) further heating the second liquid cooling fluid (B) which has been heated in step (c) by an indirect heat exchange with the heated first cooling fluid (A) of step (b); and

(e) cooling the resultant hot second cooling fluid (B) of step (d) by an indirect heat exchange with a consumer.

4,533,538
METHOD OF PRODUCING COLLOIDAL ANTIMONY OXIDE

Toshiyuki Kobashi, and Hideo Naka, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Jun. 12, 1984, Ser. No. 620,046

Claims priority, application Japan, Jun. 16, 1983, 58-108940; Dec. 21, 1983, 58-242906

Int. Cl.³ C01B *29/00*

U.S. Cl. 423—617 **6 Claims**

1. A method of producing colloidal antimony oxide by making hydrogen peroxide react with antimony trioxide to form a colloidal sol of antimony oxide, characterized by adding to the reaction system 1.5–30 mol percent of an inorganic alkaline substance based on antimony trioxide.

4,533,539
PROCESS AND ARRANGEMENT FOR THE INCREMENTAL ENRICHMENT OF DEUTERIUM AND/OR TRITIUM IN A MATERIAL SUITABLE FOR THE ISOTOPE EXCHANGE OF DEUTERIUM AND/OR TRITIUM WITH HYDROGEN

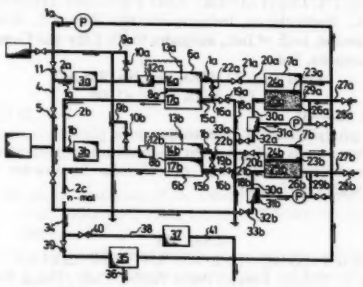
Nicolaos Iniotakis, Jülich, and Claus-Benedict von der Decken, Aachen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,479

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1981, 3123860

Int. Cl.³ C01B *5/00*

U.S. Cl. 423—648 A **15 Claims**



1. A process for the incremental enrichment of deuterium and/or tritium in a material adapted for the isotope exchange of deuterium and tritium with hydrogen, comprising introducing and reducing water containing deuterium and/or tritium in a carrier gas flow while setting a hydrogen (H_2) partial pressure of maximum 100 mbar in the carrier gas flow; thereafter conveying the carrier gas flow along the primary side of an exchange wall adapted for the permeation of hydrogen; conveying a further carrier gas flow along the secondary side of said exchange wall, said further carrier gas flow containing the material adapted for the isotope exchange in the gas phase thereof; said process being conducted under such conditions as to induce said isotope exchange as a result of permeation through said exchange wall and to enrich the carrier gas on the secondary side with deuterium and/or tritium, and conducting off reaction products from the carrier gas on the secondary side formed subsequent to the isotope exchange of deuterium and/or tritium with hydrogen.

4,533,540
NITROGLYCERIN-CONTAINING POLYMERIC MATRIX FOR SUSTAINED RELEASE ON TOPICAL APPLICATION

Izhak Blank, Haifa, Israel, assignor to Forest Laboratories, Inc., New York, N.Y.

Division of Ser. No. 524,369, Aug. 18, 1983, Pat. No. 4,482,534, which is a continuation-in-part of Ser. No. 325,833, Nov. 30, 1981,. This application Aug. 30, 1984, Ser. No. 646,001

Claims priority, application Israel, Dec. 16, 1980, 61721

Int. Cl.³ A61F *13/00;* **A61L** *15/03;* **A61K** *31/79, 31/21*

U.S. Cl. 424—28 **12 Claims**

1. A composition for the sustained transdermal administration of nitroglycerin, comprising a film or solution containing a mixture of nitroglycerin and an uncrosslinked water-insoluble vinylpyrrolidone copolymer containing at least 10% by weight vinylpyrrolidone, wherein the nitroglycerin concentration is within the range of about 1% to about 6% of the total weight of the composition.

4,533,541

TIN-117M-LABELED STANNIC (SN^{4+}) CHELATES

Suresh C. Srivastava, Setauket; George E. Meinken, Middle Island, and Powell Richards, Bayport, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 25, 1983, Ser. No. 526,251

Int. Cl.³ A61K *43/00, 49/00;* **C07F** *7/22*

U.S. Cl. 424—1.1 **5 Claims**

1. A radiopharmaceutical composition consisting of Tin-117m-labeled Stannic (Sn^{4+})-chelate in which the chelate component is a chelant selected from the group consistency of methylene diphosphonate (MDP), pyrophosphate (PYP), ethylidenehydroxydisodium phosphonate (EHDP) and diethylinetriaminopentaacetic acid (DTPA).

4,533,542

PHARMACEUTICAL COMPOSITIONS FOR STORAGE IN PLASTIC CONTAINERS AND PROCESS THEREFOR

Harry C. Buddenbaum, Indianapolis, and Robert L. Robison, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 22, 1983, Ser. No. 525,347

Int. Cl.³ A61K *9/14, 45/08*

U.S. Cl. 424—31 **23 Claims**

1. A pharmaceutical composition in a plastic container in which haze tends to form upon re-constitution, said composition cconstitution essentially of cefazolin in powder form coated with a surfactant.

4,533,543

SOFT HOMOGENEOUS ANTACID TABLET

William M. Morris, Rancho Palos Verdes, Calif.; Frank Witzel, Saratoga Springs, N.Y.; Wayne J. Puglia, Bayville, N.Y.; Donald A. M. Mackay, Plessantville, N.Y.; K. Warren Clark, Brewster, N.Y., and Kanit J. Patanasinth, Jamesburg, N.Y., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 341,967, Jan. 22, 1982, abandoned, which is a continuation of Ser. No. 175,179, Aug. 4, 1980, abandoned. This application Nov. 14, 1983, Ser. No. 551,383

Int. Cl.³ A61K *9/42, 33/06, 33/08, 33/10*

U.S. Cl. 424—38 **14 Claims**

1. In the art of forming antacid tablets by first coating particles of antacid with a coating composition and then tableting the coated particles the improvement which comprises:

employing antacid particles having a primary particle size of less than about 100 millimicrons and a melted coating composition comprising fatty material or oil, surfactant and flavorant, selected from the group consisting of chocolate, mint-chocolate, butter, vanilla, butter fat and mint flavors, said fatty material or oil being present in said coating composition in an amount of from about 25 to about 45% by weight, and

essentially increasing the bulk density of said antacid particles during the coating thereof with said coating composition by the step of intensively mixing said antacid particles by mulling or milling so as to provide for the removal of air between said antacid particles and for the homogeneous coating of said antacid particles with said coating composition.

4,533,544

METHOD OF FORMING STABLE DENTAL GEL OF STANNOUS FLUORIDE

Dennis E. Groat; Richard W. Sell, both of Dallas; Richard J. Kalish, Carrollton, and Horace E. Melton, Irving, all of Tex., assignors to Scherer Laboratories, Inc., Dallas, Tex.

Filed Mar. 26, 1984, Ser. No. 593,525

Int. Cl.³ A61K *7/18, 33/16*

U.S. Cl. 424—52 **6 Claims**

1. A method of producing a commercial-scale size batch of a stable gel consisting essentially of from about 0.38% to about 0.42% of stannous fluoride, from about 0.25% to about 0.45% hydroxyethylcelluose and the remainder anhydrous glycerin, wherein the concentration of stannous fluoride in said gel is stable during storage against deterioration to levels below that enabling the use of said gel as a topical treating agent for the prevention of dental caries, comprising the steps:

(a) dissolving the stannous fluoride present in said gel in from about 7.1% to about 7.2% of the anhydrous glycerin present in said gel at a temperature in the range of from about 150° C. to about 180° C. to form a first stannous fluoride;

(b) admixing said first stannous fluoride solution with from about 23% to about 28% of the anhydrous glycerin present in said gel at ambient temperature to form a second stannous fluoride solution;

(c) dissolving the hydroxyethylcellulose present in said gel in from about 33% to about 38% of the anhydrous glycerin present in said gel at a temperature in the range of from about 130° C. to about ½° C.;

(d) intimately admixing said hydroxyethylcelluose solution with said second stannous fluoride solution; and

(e) intimately admixing said solution with the remainder of the anhydrous glycerin present in said gel.

4,533,545

COSMETIC COMPOSITIONS CONTAINING POLYETHYLENE GLYCOL DERIVATIVES

Henri Sebag, Paris, France, assignor to L'Oreal, Paris, France

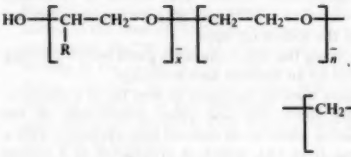
Division of Ser. No. 309,811, Oct. 8, 1981, Pat. No. 4,398,045. This application Apr. 20, 1983, Ser. No. 486,838

Claims priority, application France, Oct. 10, 1980, 80 21776

Int. Cl.³ A61K *7/06, 31/74, 47/00;* **C11D** *17/00*

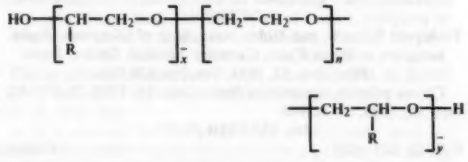
U.S. Cl. 424—70 **10 Claims**

1. A cosmetic composition for application to the hair or skin comprising in a carrier 0.2 to 10 percent by weight, based on the total weight of said composition, of a product having the formula



wherein each R represents, independently, alkyl having 8–18 carbon atoms, alkoxymethyl wherein the alkoxy moiety has 8–20 carbon atoms or alkenyloxy methyl wherein the alkenyl moiety has 8–20 carbon atoms, or a mixture thereof, $\bar{n}$ represents an average number from 20 to 500 and $\bar{x}$ and $\bar{y}$ independently represent an average number from 0 to 8 such that the sum $(\bar{x}+\bar{y})$ is from 1 to 8.

9. A thickened liquid soap for cleaning the hair or skin comprising in a carrier, 0.2 to 10 percent by weight, based on the total weight of said thickened liquid, of a product having the formula



wherein each R represents, independently, alkyl having 8–18 carbon atoms, alkoxymethyl wherein the alkoxy moiety has 8–20

carbon atoms or alkenyloxy methyl wherein the alkenyl moiety has 8–20 carbon atoms, or a mixture thereof, $\bar{n}$ represents an average number from 20 to 500 and $\bar{x}$ and $\bar{y}$ independently represent an average number from 0 to 8 such that the sum $(\bar{x}+\bar{y})$ is from 1 to 8, and an effective amount of at least one of a non-ionic, anionic, cationic, amphoteric or zwitterionic surface active agent.

4,533,546

ANTIINFLAMMATORY ANALGESIC GELLED OINTMENTS

Ikuo Kishi, Ichikawa, and Hideo Yoshida, Tokyo, both of Japan, assignors to Lederle (Japan), Ltd., Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,531
Claims priority, application Japan, Jun. 1, 1983, 58-95794
Int. Cl.³ A61K *31/19, 31/78*
U.S. Cl. 424—81 **7 Claims**

1. An antiinflammatory analgesic gelled ointment consisting essentially of

(a) 0.5 to 8% by weight of 4-biphenylylacetic acid,

(b) 0.5 to 5% by weight of a carboxyvinyl polymer, having a molecular weight in the range of 1,000,000 to 3,000,000,

(c) 0.5 to 15% by weight of a water-soluble organic amine selected from mono-, di- and tri-lower alkanol amines,

(d) 5 to 50% by weight of a lower alkanol selected from the group consisting of methanol, ethanol, propanol, isopropanol, butanol, tert-butanol and amyl alcohol, and

(e) water in an amount sufficient to make up the balance of the ointment,

the amount of the organic amine being such that the ointment has a pH in the range of from 7.0 to 9.0.

4,533,547

ANTIVIRAL ANTIBIOTIC SUBSTANCE AM-2722 AND PROCESS FOR PRODUCTION THEREOF

Satoshi Ōmura; Akira Nakagawa; Hiroshi Hashimoto, all of Tokyo; Yasuhiko Kojima, Kanagawa; Yuzuru Iwai, Chiba; Ruiko Ōiwa, Kanagawa, and Atsushi Hirano, Miyazaki, all of Japan, assignors to The Kitasato Institute, Japan

Filed May 11, 1981, Ser. No. 262,242
Claims priority, application Japan, May 10, 1980, 55-61936
Int. Cl.³ H61K *35/74;* C12P *1/06*
U.S. Cl. 424—122 **5 Claims**

1. An antiviral antibiotic AM-2722 represented by the molecular formula $C_{19}H_{26}NO_3Cl$, and having the following physicochemical properties:

(1) specific rotary power $[\alpha]_D^{20}-0.5$ (C=1, chloroform);

(2) the UV spectrum shown in FIG. 1; and

(3) the IR spectrum shown in FIG. 2.

4,533,548

ACIDIC POLYSACCHARIDE CH-1 ISOLATED FROM *CHLORELLA PYRENOIDOSA* AND THE USE THEREOF

Iwao Umezawa, Tokyo, and Kanki Komiyama, Kanagawa, both of Japan, assignors to Kitasato Institute, Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,630
Claims priority, application Japan, Dec. 2, 1981, 56-192899
Int. Cl.³ A01N *31/00;* A61K *31/70;* C12R *1/89;* C12P *19/04*
U.S. Cl. 514—54 **7 Claims**

1. An acidic polysaccharide having the following properties:

(a) consisting of carbon, hydrogen, oxygen and nitrogen with an approximate elementary analysis of O: 54.05%; C: 38.49%; H: 6.07%; and N: 1.39%;

(b) a sedimentation coefficient of $S_{20,w}=6.15$ S when determined by ultracentrifugation;

(c) impermeability to cellophane membrane,

(d) a melting point characterized by coloration at about 240° C. with carbonization at higher temperatures;

(e) a specific rotation of $[\alpha]_D^{29}=-9.52$ (c=1, H_2O);

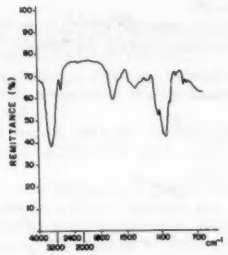
(f) solubility in water, and insolubility in methanol;

(g) a positive color reaction with anthrone, Molisch, and carbazole-H_2SO_4 and a negative color reaction with Folin-Lowry and ninhydrin;

(h) no detectable protein as measured by Folin-Lowry color reaction test;

(i) a monosaccharide analysis consisting of rhamnose, galactose, arabinose, glucose and glucuronic acid when detected by paper chromatography and gas chromatography after hydrolysis of said polysaccharide in 7% H_2SO_4 under refluxing for two hours;

(j) a UV spectrum with end absorption in 0.125% aqueous solution;



(k) an IR spectrum (KBr tablet) with absorption bands at 3420, 2930, 1640, 1380, 1125, 1065, 1040, 990, 915, 835 and 880 cm^{-1};

(l) an electrophoretic pattern on acetate membrane as shown in FIG. 2, electrophoresed to 0.8 cm for (+) with 0.1M pyridine-acetic acid at pH 5.0, 200 V (4 mA) for 20 minutes;

(m) an ultra-centrifuge pattern as shown in FIG. 3;

(n) being obtained as a white powdery precipitate; and

(o) having a sugar content of 53% when calculated as glucose.

4,533,549

ANTITHROMBOTIC AGENT

Sigmund E. Lasker, Rivercross, Roosevelt Island, New York, N.Y. 10044

Continuation of Ser. No. 455,517, Jan. 4, 1983, abandoned, which is a continuation of Ser. No. 223,010, Jan. 6, 1981, abandoned. This application Feb. 17, 1984, Ser. No. 580,761
Int. Cl.³ A61K *31/725;* C08B *37/10*
U.S. Cl. 514—56 **9 Claims**

1. An antithrombotic agent derived from heparin having an anticoagulant activity of less than 20 USP XVIII units and insignificant platelet aggregating activity, and an anti-activated coagulation factor Xa activity of from about 150 to about 190 units/mg, said agent being a pharmacologically acceptable salt of a mucopolysaccharide soluble in water, insoluble in acetone and ethanol, containing glucosamine, glucuronic acid and iduronic acid, having a weight average molecular weight of from about 2,500 to about 4,000 daltons, giving a positive metachromatic test for sulfated polysaccharides.

7. A dosage form of the antithrombotic agent of claim 1 comprising from about 100 to about 500 mg. of said agent in a pharmaceutically acceptable carrier.

4,533,550

HETEROCYCLIC DERIVATIVES OF (4-ARYLOXYMETHYL-1,3-DIOXOLAN-2-YL)METHYL-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

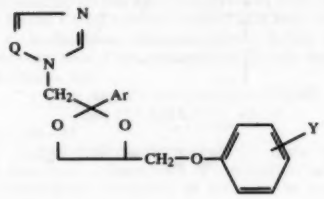
Jan Heeres, Vosselaar, and Joseph H. Mostmans, Antwerp, both of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Division of Ser. No. 134,384, Mar. 27, 1980, Pat. No. 4,313,953, which is a division of Ser. No. 20,287, Mar. 14, 1979, Pat. No. 4,218,458, which is a continuation-in-part of Ser. No. 918,257, Jun. 23, 1978, abandoned. This application Aug. 27, 1981, Ser. No. 558,331

Int. Cl.³ C07D *239/24;* A61K *31/505*

U.S. Cl. 514—256 4 Claims

1. A chemical compound selectd from the group consisting of an azole derivative having the formula:



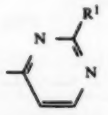
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is a member selected from the group consisting of CH and N;

Ar is a member selected from the group consisting of thienyl, halothienyl, phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of haol, lower alkyl and lower alkyloxy; and

the radical Y is

a pyrimidin-4-yl radical of the formula



(a)

wherein R^1 is a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower alkynyl, lower alkyloxy, lower alkenyloxy, lower alkynyloxy, lower alkyloxy-lower alkyloxy, aryllower alkyloxy, lower alkylthio, aryllower alkylthio, hydroxy, mercapto, amino, mono- and di-lower alkylamino, cycloalkylamino, lower alkylcarbonlylamino, arylcarbonylamino, arylamino, aryl lower alkylamino and aryl;

wherein said aryl as used in the foregoing definitions is selected from the group consisting of phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl.

4,533,551

METHOD OF TREATING ARTHRITIS WITH ETODOLAC

René Martel, Candiac, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed Feb. 17, 1984, Ser. No. 581,448

Int. Cl.³ A61K *31/40*

U.S. Cl. 514—411 3 Claims

1. A method for producing reversal of the articular pathology associated with arthritis in mammals, which comprises: administering to the arthritic mammal an effective amount of etodolac.

4,533,552

STABILIZATION OF AZULENE DERIVATIVES

Masanobu Kawamata; Koichi Ushimaru, both of Kyoto; Hiroyuki Goshi, Shiga, and Hideichi Miyasako, Moriyama, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed May 11, 1983, Ser. No. 473,452

Claims priority, application Japan, Mar. 9, 1982, 57-37411

Int. Cl.³ C07C *143/24;* A61K *31/185*

U.S. Cl. 424—78 13 Claims

1. A composition containing sodium 1,4-dimethylisopropylazulene-3-sulfonate and a stabilizing amount of a suitable polymer.

4,533,553

POLYCYCLIC ETHER ANTIBIOTIC

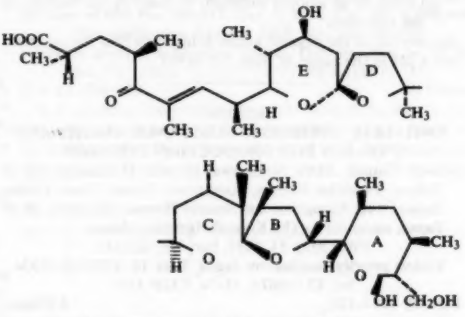
Walter D. Celmer, New London; Walter P. Cullen, East Lyme, both of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 401,234, Jul. 23, 1982, Pat. No. 4,431,801, which is a division of Ser. No. 285,264, Jul. 20, 1981, Pat. No. 4,361,649. This application Nov. 9, 1983, Ser. No. 549,912

Int. Cl.³ A61K *31/00, 31/35;* C07D *309/10, 309/22*

U.S. Cl. 514—460 3 Claims

1. In a carbohydrate-containing nutrient feed composition for cattle or swine, the improvement comprises said feed containing the antibiotic of the formula:



in an amount effective to improve feed utilization and promote growth of said cattle or swine.

4,533,554

QUINONE DERIVATIVES AND USE

Shinji Terao, Toyonaka; Mitsuru Shiraishi, and Kaneyoshi Kato, both of Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

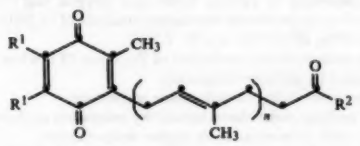
Division of Ser. No. 182,401, Aug. 26, 1980, Pat. No. 4,388,312. This application Mar. 2, 1983, Ser. No. 471,457

Claims priority, application Japan, May 18, 1979, 54-61915; Sep. 12, 1979, 54-117771

Int. Cl.³ A61K *31/185;* C07C *50/02*

U.S. Cl. 514—464 12 Claims

1. A compound of the formula



wherein

n is an integer of 1 to 10,

R^1 is methyl or methoxy, or two of R^1 combine to represent —CH=CH—CH=CH—, and

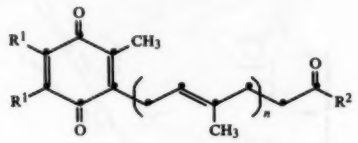
R^2 is (1) amino or (2) a mono- or di-substituted amino group selected from the class consisting of mono- or di-C_{1-6} alkylamino, C_{3-6} cycloalkylamino, C_{3-6} cycloalkyl-C_{1-3} alkylamino, phenyl-C_{1-3} alkylamino, C_{1-4} alkoxyamino and anilino

said mono- or di-substituted amino groups being unsubstituted or substituted by C_{1-4} alkyl, hydroxyl, C_{1-4} alkoxy, C_{1-4} alkylthio, carboxyl, one of mono- to decaprenyl, benzyl, 3,4,5-trimethoxybenzyl or 3,4-methylenedioxybenzyl,

or its hydroquinone form,

or a pharmaceutically acceptable salt thereof.

12. A method for the treatment of allergosis in a mammal which comprises administering to said mammal an effective amount of a compound of the formula:



wherein

n is an integer of 1 to 10,

R^1 is methyl or methoxy, or two of R^1 combine to represent —CH=CH—CH=CH—, and

R^2 is (1) amino or (2) a mono- or di-substituted amino group selected from the class consisting of mono- or di-C_{1-6} alkylamino, C_{3-6} cycloalkylamino, C_{3-6} cycloalkyl-C_{1-3} alkylamino, phenyl C_{1-3} alkylamino, C_{1-4} alkoxyamino and anilino

said mono- or di-substituted amino groups being unsubstituted or substituted by C_{1-4} alkyl, hydroxyl, C_{1-4} alkoxy, C_{1-4} alkylthio, carboxyl, one of mono- to decaprenyl, benzyl, 3,4,5-trimethoxybenzyl or 3,4-methylenedioxybenzyl,

or its hydroquinone form,

or a pharmaceutically acceptable salt thereof.

4,533,555

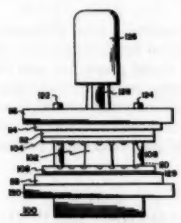
APPARATUS FOR THERMOFORMING DOME-SHAPED ACTUATING ELEMENTS FOR MEMBRANE SWITCHES

George E. Harris, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed May 9, 1984, Ser. No. 608,591

Int. Cl.³ B29C *17/00*

U.S. Cl. 425—384 **15 Claims**



1. An apparatus for thermoforming a plurality of depressible protrusions in a substantially thin and flat plastic sheet; said thermoforming apparatus comprising:

(A) a pair of male and female die plates, respectively, having a plurality of matching projections and cavities;

(B) a selectively-operated means for closing and opening said die plates;

(C) means for heating one of said die plates to a desired temperature;

(D) means for cooling the other of said die plates to a preset temperature; and

(E) a selectively-actuated holding means for securing a heated, thermoformed plastic sheet to said cooled die plate;

wherein a plastic sheet is clamped under pressure between said die plates for a certain length of time to cause thermoforming of said protrusions in said plastic sheet, and said die plates are separated with said plastic sheet held against said cooled die plate to allow said plastic sheet to cool off.

4,533,556

KOLA FLAVORED CHEWING GUM AND PREPARATION THEREOF

Dominic J. Piccolo, Brooklyn, N.Y., and Deborah J. Feinerman, Asbury Park, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 14, 1983, Ser. No. 504,205

Int. Cl.³ A23G *3/30*; A23L *1/221*

U.S. Cl. 426—3 **12 Claims**

1. A kola flavored chewing gum composition having improved perceptable kola flavor wherein the improvement comprises the addition of the combination of an artificial oil-soluble kola flavor in the amounts of about 0.05% to about 5.0% and natural kola extract in the amounts of 0.05% to about 2.0%, percents being by weight of the total composition.

4,533,557

FEED ADDITIVES FOR RUMINANTS

Hiromi Maruyama; Seiji Sasaoka; Mitsuo Kiuchi, and Hironori Kanehara, all of Chiba, Japan, assignors to Nippon Soda Co. Ltd., Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,853

Claims priority, application Japan, Apr. 2, 1982, 57-54978; Oct. 7, 1982, 57-176803

Int. Cl.³ A23K *1/00*

U.S. Cl. 426—61 **1 Claim**

1. A granular feed additive for ruminants consisting of edible material of at least one biologically active ingredient, a protective material and chitosan, wherein, the biologically active ingredient is a material selected from the group consisting of amino acids, amino acid derivatives, hydroxy homologues of amino acids, proteins, vitamins, enzymes, and mixtures thereof; the protective material is a material selected from the group consisting of straight or branched saturated or unsaturated aliphatic mono-carboxylic acids having from 14 to 22 carbon atoms; wherein the quantity of chitosan is in the range of 1 to 25 parts by weight of the protective material, the quantity of the biologically active ingredient is not more than 60 parts by weight of the total weight; the particle size of the biologically active ingredient is about 110 Tyler mesh pass to about 170 Tyler mesh pass, the particle size of the chitosan is about 65 Tyler mesh pass, said feed additive being soluble in a buffer solution having a pH of about 2 consisting of about 50 parts of 0.2N KCl and about 10 parts of 0.2N HCl mixed in about 140 parts of water, said buffer solution corresponding to the digestive juice in the abomasum of said ruminant.

4,533,558

TOASTING PROCESS USING A TOAST GUARD

David W. Ogle, 5 Sunset La., Bushnell, Ill. 61422

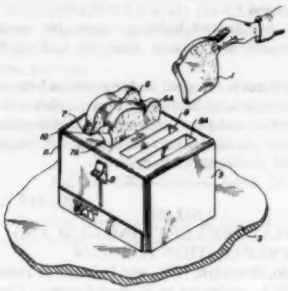
Division of Ser. No. 593,611, Mar. 26, 1984, abandoned. This application Dec. 24, 1984, Ser. No. 685,206

Int. Cl.³ A23B *4/04*

U.S. Cl. 426—466 **1 Claim**

1. A process to enable slices of bread to be toasted evenly on each side in a multi-slotted toaster when only some of the slots of the multi-slotted toaster are used, comprised of inserting the slices of bread in some of the slots of the toaster, inserting a ceramic piece molded in the shape of a slice of bread which is

fired and glazed so as to be heat absorbing and slightly smaller in size and thickness than a slice of bread in a vacant slot of the



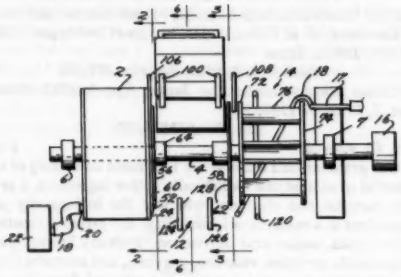
toaster adjacent a slot in which a slice of bread is inserted and then activating the toasting mechanism of the toaster.

4,533,559

PROCESS FOR PRODUCING AN ASSEMBLER FOR A FLEXIBLE FOODSTUFF

Lorne A. Rowell, Victoria, Canada, assignor to McCormick & Company, Incorporated, Hunt Valley, Md.

Filed Apr. 27, 1983, Ser. No. 488,984
Int. Cl.³ A21D *6/00*; A23P *1/00*
U.S. Cl. 426—499 **6 Claims**



1. A method for preparing a food-cooking assembly which assembly includes an inner perforated cylinder, a flexible sheet of foodstuff wrapped around the outside of the inner cylinder and an outer cylinder surrounding the wrapped sheet of foodstuff, said method comprising: mounting the inner perforated cylinder in a carrier; applying a vacuum to the inside of the inner cylinder; moving the carrier along a predetermined path such that the inner cylinder moves transversely with respect to its axis into engagement with a surface of the flexible sheet of foodstuff whereby the vacuum holds the sheet of foodstuff to the outside of the inner cylinder and continuing to move the carrier along said path so that the inner cylinder and the sheet of foodstuff move past guide means which effects wrapping of the sheet around the inner cylinder; and effecting relative telescoping movement between the inner and outer cylinders so that the outer cylinder engages and surrounds the wrapped sheet.

4,533,560

NON-DAIRY PARFAIT TYPE DESSERT MIX

Peter Procunier, 68 MacPherson, Ontario, Canada (M5R 1W8)

Filed Aug. 3, 1983, Ser. No. 519,910
Int. Cl.³ A23L *1/187*
U.S. Cl. 426—578 **7 Claims**

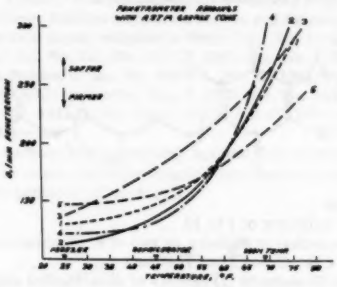
1. A dry food mix for use in preparing a nondairy parfait product comprising flavoring of from 0.7%–11% and a base containing sugar 65%–81%, starch 7.5%–11%, emulsifiers 2%–6%, anti-caking agents 0.08%–0.2%, salt 0.4%–1.2% and an anti-mycotic agent 0.08%–0.3%; said mix when added to water and oil in substantially equal weights and mixed forms a non-dairy parfait product.

4,533,561

LOW-FAT SPREAD AND PROCESS

John Ward, Mississauga, Canada, assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Sep. 30, 1982, Ser. No. 431,873
Int. Cl.³ A23D *3/00, 3/02*
U.S. Cl. 426—603 **21 Claims**



1. A low-fat spread comprising: from about 50% to about 70% of a highly-dispersed aqueous phase; and from about 30% to about 50% of a continuous fat phase comprising a blend of from about 70% to about 95% by weight of a liquid vegetable oil and from about 5% to about 30% of a hardstock, the blend comprising from 10 to 30% of the fatty acids as C10, C12, C14 and C16 fatty acids, these fatty acids being predominantly in the trisaturated glyceride form, and the solid fat is present predominantly in the beta-prime crystal form.

4,533,562

METHOD OF PREPARING COATED SOLID PREPARATIONS

Yoshihiko Ikegami; Kozo Kurihara; Izuo Ichikawa, and Hisanori Nakane, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Continuation of Ser. No. 366,063, Apr. 6, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 601,736
Claims priority, application Japan, Apr. 13, 1981, 56-55232
Int. Cl.³ A61R *9/32*; C08L *1/32*
U.S. Cl. 427—3 **22 Claims**

1. A method of coating a solid pharmaceutical preparation consisting essentially of first coating said solid pharmaceutical preparation with a liquid plasticizer and then coating with a powdered film-forming polymer, said liquid plasticizer swelling or dissolving said polymer whereby said powdered polymer particles are plasticized and form a substantially uniform coating on said solid pharmaceutical preparation.

4,533,563

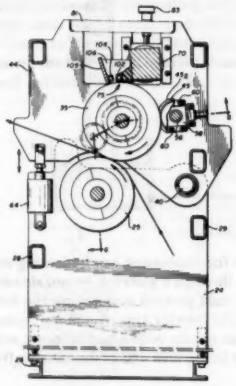
COATING METHOD

Harold P. Dahlgren, 4008 Buena Vista, Dallas, Tex. 75205; John W. Gardiner, 2116 Oak Meadows, Bedford, Tex. 76021, and James E. Taylor, 4129 Drowsy La., Dallas, Tex. 75233

Division of Ser. No. 323,099, Nov. 19, 1981, Pat. No. 4,444,147, which is a continuation-in-part of Ser. No. 282,294, Jul. 13, 1981, abandoned. This application Feb. 9, 1984, Ser. No. 578,659
Int. Cl.³ B05D *1/28*
U.S. Cl. 427—387 **12 Claims**

1. A method of forming a thin continuous glaze on a web

substrate comprising the steps of: positioning a transfer roll having a smooth resilient surface and a metering member having a flat metering surface and a metering edge in pressure indented relation to form a metering wedge; depositing a mixture of liquid silicone reactive polymer and a cross-linker on the smooth resilient roll surface; rotating the resilient roll to move a portion of the mixture of liquid silicone reactive polymer and cross-linker through the metering wedge to form a metered film of liquid and to transfer the film of liquid directly to a web substrate; moving a web substrate in engagement with



the resilient transfer roll surface and at substantially the same surface speed as the resilient roll surface; urging a backup roll into engagement with the web such that the resilient surface on the transfer roll is deformed by the web to apply a continuous glaze of the mixture of liquid silicone reactive polymer and cross-linker to the surface of the web substrate; and controlling the indentation of the metering edge into the resilient roll surface to control the thickness of the glaze of liquid applied by the transfer roll to the web to a range between one-tenth and one pound per 3,000 square feet.

4,533,564

METHOD OF MANUFACTURING AN ELECTROPHOTOGRAPHIC PHOTORECEPTOR

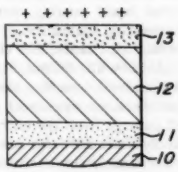
Hiroaki Kakinuma; Mamoru Yoshida, and Satoshi Nishikawa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 645,139

Claims priority, application Japan, Sep. 7, 1983, 58-163174; Sep. 28, 1983, 58-179886

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—39 **7 Claims**



1. In a method of manufacturing an electrophotographic photoreceptor which is utilized in positive charging system having an electrically conductive substrate, a first layer provided on the substrate for preventing injection of electrons into the photoreceptor from the substrate, a second layer of amorphous silicon provided on the first layer for determining charging characteristic of the photoreceptor and a third layer provided on the second layer for preventing injection of holes into the photoreceptor from the surface thereof and for effecting passivation of the surface, the improvement comprising the second layer being subjected to doping of boron, which is effected by introducing a mixed gas of boron and silicon with a ratio of 0.2–2 ppm into a growth chamber.

4,533,565

METHOD FOR SURFACE TREATMENT OF FERROMAGNETIC FINE POWDER AND FORMING A MAGNETIC RECORDING DEVICE

Tsutomu Okita, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 449,813, Dec. 14, 1982, abandoned. This application May 24, 1984, Ser. No. 613,759

Claims priority, application Japan, Dec. 14, 1981, 56/201310

Int. Cl.³ H01F *10/02*

U.S. Cl. 427—44 **7 Claims**

1. A method for producing a magnetic recording medium which comprises the steps of (1) preparing ferromagnetic fine powder by the process comprising:

(A) subjecting a composition to dispersion processing, wherein the composition comprises:

(i) a ferromagnetic powder;

(ii) a polar compound selected from the group consisting of acrylic acid, crotonic acid and bis(β-acryloyloxyethyl)phosphate; and

(iii) an organic solvent capable of dissolving the polar compound; and

(B) evaporating the organic solvent from the resulting composition, (2) dispersing said ferromagnetic fine powder of (1) in a binder comprising a compound polymerizable by irradiation with electron beams and has (meth)acryloyl groups at both ends of the molecule, (3) forming, on a support, a magnetic layer from the resulting composition and (4) irradiating the magnetic layer with electron beams.

4,533,566

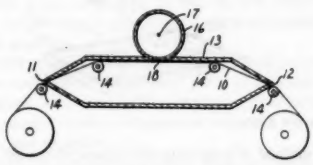
ELECTRON-BEAM ADHESION-PROMOTING TREATMENT OF POLYESTER FILM BASE FOR SILICONE RELEASE LINERS

Jack L. Evans, St. Paul; Karen J. Campbell, White Bear Township, Ramsey County; Curtis L. Kreil, Woodbury, and LuAnn Sidney, White Bear Township, Ramsey County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 5, 1984, Ser. No. 628,153

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—44 **13 Claims**



1. In the manufacture of a release liner comprising a flexible polyester film base and a thin silicone coating, a method for promoting the adhesion to the polyester film base of the silicone coating, which method comprises the steps of (1) continuously passing uncoated polyester film base through an inert atmosphere containing less than 500 ppm oxygen while (2) exposing the film base to irradiation of an electron beam to subject the film base to an absorbed dosage of at least 2 Mrad, and (3) applying a thin silicone coating to a face of the film base

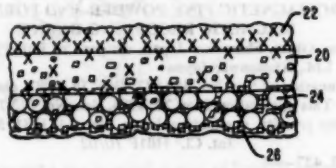
to which adhesion of the coating has been enhanced by virtue of steps (1) and (2).

4,533,567

CARBONLESS PAPER COATING FORMULATION

Nicola Marinelli, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 24, 1983, Ser. No. 497,773
Int. Cl.³ B41M 5/22
U.S. Cl. 427—150 5 Claims



1. A method of making pressuresensitive record media with a substrate having front and back surfaces, comprising the steps of

providing a color-forming coating material in encapsulated form for the back surface,

mixing an aqueous emulsion of wax with the back surface coating material, the aqueous emulsion containing a wax selected from the group having a polyethylene base,

coating the substrate on the back surface with the mixture of encapsulated material and wax emulsion in a manner wherein the wax emulsion substantially envelops the encapsulated material, and

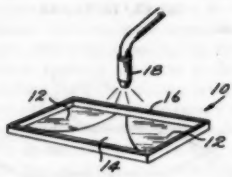
coating the substrate on the front surface with a material having color-developing phenolic resin as an ingredient thereof whereby the phenolic resin reacts with the color-forming coating material to form an image upon rupture of the encapsulated material.

4,533,568

METHOD OF PREPARING A PATTERNED MOLD SURFACE

John L. McClinton, Hanover, and Alexander H. Russell, Owings Mills, both of Md., assignors to The Burns & Russell Company, Baltimore, Md.

Filed Aug. 24, 1983, Ser. No. 526,143
Int. Cl.³ B29C 1/04
U.S. Cl. 427—135 10 Claims



1. A method of preparing the surface of a mold for forming a pattern on a molded article comprising the steps of:

applying masking material to the mold surface to cover a selected surface area thereof,

directing a surface altering media against said mold surface to alter the surface texture of the uncovered area of the mold surface, said uncovered area corresponding to said pattern to form a coated mold surface having areas of altered surface texture corresponding to said pattern,

removing the masking material from the mold surface,

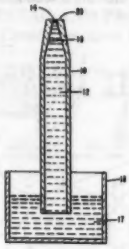
and, then, coating the mold surface with a metal including the previously masked as well as the unmasked areas.

4,533,569

PROCESS PREVENTING AIR BUBBLE LOCK IN INK JET NOZZLES

Richard G. Bangs, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1983, Ser. No. 559,510
Int. Cl.³ B05D 3/10, 5/00, 7/22
U.S. Cl. 427—154 8 Claims



1. A process for decreasing or eliminating air bubble lock in an ink passage through a glass ink jet nozzle usable in an ink jet printer device, said process comprising the following steps:

(a) cleaning the interior area of said ink passage through said glass ink jet nozzle with a hydrofluoric acid solution so as to remove impurities and contaminants from said surface area;

(b) rinsing said ink passage to remove said hydrofluoric acid solution from said surface area before visible etching of said surface area occurs; and

(c) introducing and continuously maintaining a blocking agent in said ink passage prior to the use of said nozzle in an ink jet printer device to prevent atmospheric air from contaminating the surface area of said ink passage, wherein said blocking agent is miscible and chemically compatible with ink to be conducted through said ink passage during the use of said ink jet nozzle in ink jet printing.

4,533,570

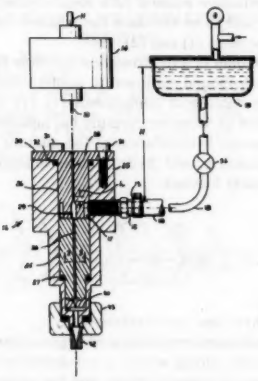
METHOD AND APPARATUS FOR COATING OPTICAL WAVEGUIDE FIBERS

Rama Iyengar, Lilburn, Ga., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 369,874, Apr. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 265,713, May 20, 1981, abandoned. This application Jun. 9, 1983, Ser. No. 502,882
Int. Cl.³ G02B 1/10, 5/14
U.S. Cl. 427—163 2 Claims

1. A method of coating an optical fiber being drawn from a heated, rod-shaped glassy preform comprising the steps of passing the optical fiber downwardly through an applicator containing a viscous liquid coating material, the applicator having a channel extending therethrough from a channel entry end to a coating sizing die channel exit end, the channel being in fluid communication with viscous liquid coating material being supplied by a reservoir, passing the optical fiber downwardly through a restricted open end of a relatively long narrowly confined passage from the entry end of the channel passage to a relatively short and large passage at an intermediate portion of the channel, the narrowly confined passage having a relatively small amount of clearance between the wall thereof and the surface of the fiber passing therethrough, the short and large passage being relatively short compared to the narrowly confined passage and having a cross-sectional area substantially larger than that of the narrowly confined passage and that of the fiber, feeding the viscous liquid coating material under pressure from the reservoir of the viscous liquid coating material at a relatively high pressure into the relatively short

and large passage in the applicator through a passageway including at least one aperture in the channel and into the relatively long narrowly confined passage while passing the fiber through the applicator channel at a velocity relative to the viscosity of the coating material and a relatively narrow spacing between the fiber and the wall of the narrowly confined passage such as to create relatively higher shear forces in the liquid coating material contained therein sufficient to cause an action on the fiber which prevents the coating material under its fluid pressure from exiting the applicator through the relatively long narrowly confined passage whereby due to the relatively high fluid pressure of the coating material created by the relatively high shear forces creates a bubble barrier therein and air bubbles tend to be inhibited from being drawn from ambient atmosphere into the liquid coating material, since only a relatively small surface area of the viscous liquid coating



material between the fiber and wall of the narrowly confined passage is exposed to ambient atmosphere bubbles are inhibited from being formed in the viscous liquid coating material and descending in the liquid coating material in the relatively long narrow confined passage in the channel, and causing the fiber to move through a lower relatively long and narrowly confined cylindrical passage having a diameter slightly larger than that of the narrowly confined passage at the entrance end of the channel and on to the sizing die at the exit end of the applicator to create additional relatively high shear forces in the coating material and cause a still higher pressure in the coating material which tends to inhibit any bubbles of air which may tend to be entrained by the fiber from passing on through the applicator on the liquid coated fibers, with centering of the elongated material in the sizing die also being improved as result of a relatively extremely high pressure in the coating material as a result of the relatively high shear forces.

4,533,571

METHOD AND APPARATUS FOR UNIFORMLY COATING A SUBSTRATE WITH A POWDER

Carl Kramer, and Hans-Werner Kuster, both of Aachen, Fed. Rep. of Germany, assignors to Saint Gobain Vitrage, Courbevoie, France

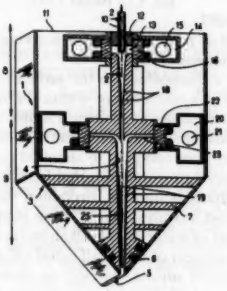
Filed Mar. 12, 1984, Ser. No. 588,330
Claims priority, application France, Mar. 14, 1983, 83 04125
Int. Cl.³ B05D 1/12
U.S. Cl. 427—180 **16 Claims**

1. A method for regularly distributing a powder on a substrate comprising the steps of:

introducing the powder into an elongated nozzle through a multiplicity of separate feeds that enter the nozzle at points removed from the substrate to be coated,

mixing the powder in an enclosure in said nozzle with gases that are blown into said enclosure uniformly over the entire length of said enclosure,

channeling the powder suspended in the gas between the opposite walls of a slit leading from the enclosure to form a thin sheet of powder whose length extends over the entire width of the substrate,



surrounding the sheet of powder with additional gas streams having the same velocity as the powder sheet and extending over the entire length of the sheet on each side and aimed approximately in the direction of the substrate, and

accelerating the powder sheet in the direction of the substrate.

4,533,572

PROCESS FOR PRODUCING VARNISH-BONDED CARBON-COATED METAL GRANULES

Ramaswami Neelameggham; Hedayat Abedi, both of Salt Lake City, Utah; John C. Priscu, Las Vegas, Nev., and Michael H. Legge, Tooele, Utah, assignors to AMAX Inc., Greenwich, Conn.

Filed Mar. 20, 1984, Ser. No. 591,658
Int. Cl.³ B05D 7/00
U.S. Cl. 427—216 **15 Claims**

1. A process for producing a substantially non-hygroscopic protectively-coated deoxidizing and desulfurizing agent in the form of metal granules for use in the treatment of molten iron and steel which comprises:

providing a free flowing charge of metal granules selected from the group consisting of Mg, Al and alloys thereof with a polymerizable oil coating around substantially each of said granules,

heating said charge of oil-coated granules to a polymerizing temperature below the melting point of said metal granules under substantially non-oxidizing conditions while mechanically mixing said granules to form a varnish coating on said granules, and

then raising the temperature of said varnish-coated granules to a decomposition temperature below the melting point of the metal granules to effect at least a partial conversion of said varnish to carbon and thereby produce a carbon coating strongly bonded to said granules by means of said varnish,

whereby said carbon-coated granules are protected against corrosion and the formation of hydrous oxides and also are characterized in that the pyrophoricity thereof is substantially inhibited when added to a molten iron or steel bath.

4,533,573

ANTI-SCALING OR MARKING COMPOSITION FOR APPLICATION TO METAL PRODUCTS AND METHOD OF MAKING AND USING THE COMPOSITION

Bruno M. Perfetti, Jeannette Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 445,790, Dec. 1, 1982,. This application Jan. 11, 1984, Ser. No. 569,822
Int. Cl.[3] B05D 5/00
U.S. Cl. 427—287 4 Claims

1. A method of producing legible markings on metal products, said method comprising:

(a) applying a composition to the surface of metal products which are at a temperature within the range of 1800° to 2500° F. in a manner to produce a legible marking thereon, said composition consisting essentially of

(i) solids of from about 30 to about 50 parts by weight of an opacifying pigment selected from the group consisting of titanium dioxide, zirconium silicate, chromium oxides and mixtures thereof, from about 43 to 58 parts by weight of water soluble alkali metal silicate binder, at least 50 percent of the alkali metal silicate in said binder being sodium silicate, the ratio of silicate to alkali metal oxide in said alkali metal silicate being within the range of 2.60 to 3.25, and a cross-linking binder selected from the group consisting of borax, boric oxide, sodium metaborate, barium metaborate, and mixtures thereof in sufficient amounts to provide from about 1.5 to about 5.0 parts by weight of B_2O_3, the ratio of total pigment to total binder solids being within the range of 0.50 to 1.0;

(ii) said solids being suspended in that amount of water to give said composition a viscosity within the range of 800 to 5000 centipoise, and

(b) baking said markings substantially by air cooling said metal products from said temperature to produce an adherent mark which will not flake off.

4,533,574

POLYIMIDE COATING COMPOSITIONS OF ESTERIFIED ANHYDRIDE AND AROMATIC AMINE MIXTURE

Michael Fryd, Haddonfield, and Burt T. Merriman, Jr., Willingboro, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 14, 1984, Ser. No. 650,759
Int. Cl.[3] B05D 3/02
U.S. Cl. 427—385.5 8 Claims

1. A method of applying a polyimide coating have both solvent resistance and high planarity comprising the sequential steps:

(a) forming a solution in aprotic solvent of an aromatic dianhydride which has been at least 20% diesterified with a volatile alcohol;

(b) dissolving in the solution of step (a) a substantially equimolar amount of a mixture of aromatic amines comprising 90–99 mole % diamine and 10–1 mole % salt of tri- or tetra-amine and volatile organic acid;

(c) applying the solution of step (b) to a substrate and heating it to a temperature of 200°–300° C. to effect de-esterification of the dianhydride with the formation of volatile alcohol therefrom, formation of polyamic acid by polycondensation with the aromatic amines and vaporization of volatile alcohol and solvent from the reaction solution;

(d) heating the polyamic acid to 300°–500° C. to effect decomposition of the tri- or tetra-amine salt with the formation of volatile organic acid, substantially complete alcohol, organic acid and solvent removal, dehydration of the polyamic acid, formation of the corresponding polyimide, crosslinking and reflow of the polyimide, the polyimide having a T_g of 250°–330° C. and containing repeating polymer units having at least 2 flexible linkages or 1 flexible linkage derived from the dianhydride, provided the amine groups of the diamine are in the meta position relative to each other.

4,533,575

LATENTLY-CURABLE ORGANOSILICONE RELEASE COATING COMPOSITION

Kurt C. Melancon, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 535,040, Sep. 23, 1983, Pat. No. 4,504,645. This application Dec. 18, 1984, Ser. No. 683,212
Int. Cl.[3] B05D 3/02
U.S. Cl. 427—387 8 Claims

1. A process comprising the steps:

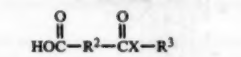
(a) providing a latently-curable organosilicone composition by mixing at ambient temperatures

(1) an ethylenically-unsaturated polysiloxane,

(2) a polyhydrosiloxane,

(3) an effective amount of a metal-containing hydrosilation catalyst to facilitate the addition cure reaction of components (1) and (2), and

(4) an amount of a hydrosilation inhibitor 1,4-dicarboxylic acid compound sufficient to inhibit premature gelation of the mixture of components (1), (2), and (3) at low, ambient or room temperature but insufficient in amount to prevent hydrosilation of the mixture at an elevated temperature, said hydrosilation inhibitor having the structural formula



III

wherein

R^2 is ethynylene or cis-ethenylene;

R^3 is a saturated or unsaturated organic group having 1 to 12 carbon atoms which is unsubstituted or substituted by 1 to 23 halogen atoms, and has up to 25 hydrogen atoms; and

X is —O— or

in which R^4 is the same as defined for R^3, and R^3 and R^4 together with the N can form a saturated azacyclic ring,

(b) coating a substrate with said admixture, and

(c) elevating the temperature of the resulting coated admixture when cure of said admixture is to be effected.

4,533,576

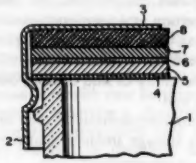
COMPOSITE MATERIAL FOR PACKAGING CONTAINERS

Toshifumi Tanahashi, Yokohama, and Senji Itoh, Ayase, both of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Aug. 3, 1983, Ser. No. 519,812
Claims priority, application Japan, Aug. 6, 1982, 57-136348
Int. Cl.[3] B32B 27/36
U.S. Cl. 428—35 12 Claims

1. A composite material for packaging containers, said composite material consisting of a metallic foil and a thermoplastic resin selected from the group consisting of polyolefinic resins, polyester resins, polyamide resins, polycarbonate resins and mixtures thereof, said thermoplastic resin layer having a thickness of 1 to 20 microns and a surface roughness of not more than 4.0 μm Rmax L0.80 mm, said thermoplastic resin having a carbonyl concentration of 1 to 600 milliequivalents/100 g of resin for the polyolefinic resins, 1,000 to 1,300 mil-

liequivalents/100 g of resin for the polyester resins, 500 to 1,200 milliequivalents/100 g of resin for the polyamide resins



and 600 to 800 milliequivalents/100 g of resin for the polycarbonate resins.

4,533,577

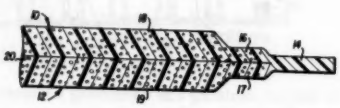
CONTAINER HAVING HEAT SEALED JUNCTURE REGION

Marjory A. Mier, Somerset, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 453,243, Dec. 27, 1982,. This application Dec. 21, 1983, Ser. No. 563,739

Int. Cl.³ B32B *3/02, 3/26, 5/14*

U.S. Cl. 428—35 **10 Claims**



1. A container comprising a first layer of a foam polymer sheet material;

a second layer of a polymer sheet material which is heat-sealed to said first layer;

said first layer having a flexible and foldable area of crushed and compressed cellular structure free of fusion caused by crushing and compressing directly adjacent the heat-sealed portion, said flexible and foldable area of crushed and compressed cellular structure having a width which is at least as great as the thickness of uncompressed foam in said first layer, said flexible and foldable crushed and compressed cellular structure being adjacent at least one of the two major surfaces of said first layer.

4,533,578

SANDWICH FOAM COEXTRUSION FOR HIGH PERFORMANCE POLYOLEFIN TRASH BAGS

Dana M. Boyd, Rushville; Edward A. Colombo, Fairport, and William H. Lashway, Rochester, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,933

Int. Cl.³ B32B *1/02, 1/08, 27/06, 27/32*

U.S. Cl. 428—35 **9 Claims**

1. A three-ply plastic bag structure comprising a U-folded layflat joined at two ends thereof by at least one heat seal at each end, the heat seals defining an opening of the bag, said U-folded layflat comprising an upper member and a lower member, the upper member being positioned substantially parallel to and above the lower member, the upper member being joined to the lower member by a U-fold of said U-folded layflat and by the heat seals positioned substantially perpendicularly to the U-fold, the upper and the lower members comprising:

(i) outermost and innermost skin layers substantially composed of one or more high performance polyolefin resins, said skin layers being of equal or different thickness, said skin layers each having a thickness between about 0.25 and about 0.50 mils; and

(ii) a middle foamed thermoplastic layer having a density of at least 25% less than the density of the corresponding unfoamed version of said layer, the thickness of said foamed layer being between about 0.25 and about 1.5 mils.

4,533,579

VIBRATION-RESISTANT, HEAT-INSULATING CASTING AND METHOD OF MAKING

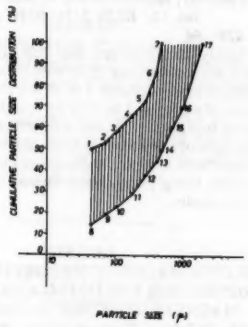
Kametaro Hashimoto; Kenji Ushitani; Fumiyoshi Noda; Masahiko Sugiyama, and Mikio Murachi, all of Toyota, Japan, assignors to Toyoda Jidosha Kogyo Kabushiki Kaisha, Toyoda, Japan

Continuation of Ser. No. 317,340, Nov. 2, 1981, abandoned, which is a continuation of Ser. No. 161,404, Jun. 20, 1980, abandoned, which is a continuation of Ser. No. 924,348, Jul. 13, 1978, abandoned, which is a continuation of Ser. No. 715,977, Aug. 19, 1976, abandoned, which is a division of Ser. No. 559,882, Mar. 19, 1975, abandoned. This application Sep. 24, 1982, Ser. No. 423,172

Claims priority, application Japan, Mar. 23, 1974, 49-32880

Int. Cl.³ B22D *19/00*

U.S. Cl. 428—36 **14 Claims**



1. A vibration-resistant heat-insulating casting consisting essentially of (a) a ceramic part manufactured by molding particles of ceramic material having a cumulative particle size distribution within the shaded area indicated in FIG. 4 of the drawings as filed, and firing the molded ceramic, and (b) a metal cast around said ceramic part, said ceramic material being selected from the group consisting of alumina, cordierite, zirconia and glass ceramic and said casting metal being selected from aluminum alloy and cast iron.

4,533,580

COMPOSITE INSULATION MATERIAL

Malcolm Otty, Westering, Mill Hay Rd., Caldy, Merseyside, England

Continuation of Ser. No. 392,618, Jun. 28, 1982, abandoned. This application Apr. 19, 1984, Ser. No. 601,126

Claims priority, application United Kingdom, Jul. 1, 1981, 8120234

Int. Cl.³ B32B *3/06*

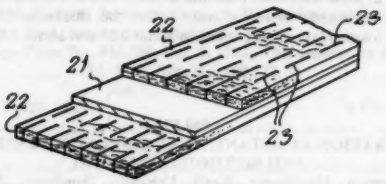
U.S. Cl. 428—36 **9 Claims**

1. A composite insulation material for the slot-fitting coils of large rotating electric plants comprising:

a micaceous layer; and

outer layers of a textile material capable of being compressed

and of absorbing resin, said composite insulation material being preformed in the form of a channel section having



an elongated concavity shaped for application to the slot fitting portion of a coil.

4,533,581

HIGHLY HEAT-RESISTANT DISC ROLL

Hiroshi Asaumi, 1-17-30, Iwase, City of Kamakura, Kanagawa Prefecture; Shigeo Take, 1530-99, Terao, City of Ayase, Kanagawa Prefecture; Masazumi Akase, 303-1-2, Katsura-cho, Tozuka-ku, City of Yokohama, Kanagawa Prefecture, and Isao Terada, 1-5-21, Tsurumi, Tsurumi-ku, City of Yokohama, Kanagawa, Japan

Filed Mar. 7, 1983, Ser. No. 473,105

Claims priority, application Japan, Mar. 9, 1982, 57-35893

Int. Cl.³ B32B *5/16*; B21B *27/00*

U.S. Cl. 428—64 **1 Claim**

1. A highly heat-resistant disc roll comprising laminated discs, each disc comprising 20 to 90% by weight, based on the total solids, of mica particles, 1 to 35% by weight, based on the total solids, of a binder, 5 to 40% by weight, based on the total solids, of an inorganic filler and 1 to 30% by weight, based on the total solids, of a reinforcing fiber, at least 60% by weight of said mica particles having a particle size of 10 to 1,000 μm, said mica particles being phlogophite formed by cleavage of mica crystals into scales.

4,533,582

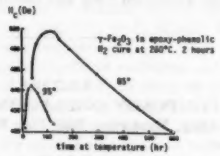
STABILIZED MAGNETIC RECORDING MATERIALS AND PROCESS FOR TAILORING AND STABILIZING OF MAGNETIC RECORDING MATERIALS

Vincent M. DePalma, Pleasant Valley, N.Y., and Albert W. Ward, Santa Cruz, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 380,658, May 21, 1982, abandoned, which is a continuation-in-part of Ser. No. 219,620, Dec. 24, 1980, abandoned. This application Jul. 19, 1983, Ser. No. 515,327

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—64 **14 Claims**



1. A method of imparting a storage stable preselected magnetic coercivity value to a film of a magnetic coating composition on a substrate and including a heat curable binder system having magnetic particles therein, comprising the steps of:

curing said coating composition in an anaerobic atmosphere by heating said film at a temperature and for a period of time effective to cure the binder system and raise the magnetic coercivity of said coating composition to a first, storage unstable value lower than said preselected value but substantially higher than the value achievable when said coating composition is cured in air;

annealing said cured composition by heating said cured coating composition at a temperature substantially lower than said curing temperature, but higher than standard room temperature, for a period of time effective to further increase the coercivity of said coating composition to the selected value; and

cooling said coating composition thereby rendering its magnetic coercivity storage stable at said pre-selected value.

4,533,583

THERMAL INSULATING MAT

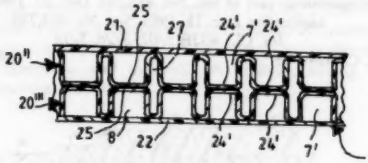
Michael G. May, Bel Air, CH 1180 Rolle, Switzerland

Continuation of Ser. No. 380,854, May 21, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 591,236

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120411

Int. Cl.³ B32B *3/04*

U.S. Cl. 428—69 **10 Claims**



1. A thermal insulating mat comprising a plurality of sealed chambers filled with a filler gas having a heat conductivity lower than air, said sealed chambers being formed by spaced flexible film with at least two layers of separate chambers formed by separate continuous flexible films disposed one over the other with said separate continuous films having portions thereof that extend parallel with said spaced film and adjacent portions that extend perpendicular to said spaced film with said parallel portions secured in a gas-tight manner to at least one of said spaced film thereby forming a plurality of separate chambers between said spaced parallel film.

4,533,584

MULTI-CHANNEL BODY

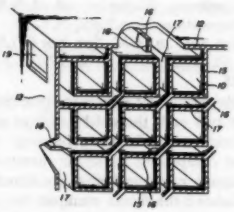
Yukihisa Takeuchi, and Tadashi Fujita, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 2, 1984, Ser. No. 596,103

Claims priority, application Japan, Apr. 5, 1983, 58-58752

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—116 **7 Claims**



1. A multi-channel body comprising:

an outer wall;

a plurality of parallelly situated independent channels located inside of said outer wall, each of said independent channels being defined by partition walls having an inner

surface and an outer surface and each parallelly situated independent channel does not share any portion of any partition wall with any other parallelly situated independent channel, whereby a first fluid passes through said parallelly situated independent channels in contact with inner surfaces of said partition walls;

a plurality of connecting walls for connecting said parallelly situated independent channels and at least one connecting wall communicates with one partition wall of each independent channel, whereby a plurality of continuous passages are formed throughout said multi-channel body around said plurality of parallelly situated independent channels, said continuous passages being defined by outer surfaces of said partition walls, said connecting walls and said outer wall of the multi-channel body, thereby permitting a second fluid to pass through said plurality of continuous passages in contact with outer surfaces of said partition walls;

at least one inlet in said outer wall of the multi-channel body communicating with said continuous passages to permit said second fluid to enter said continuous passages; and

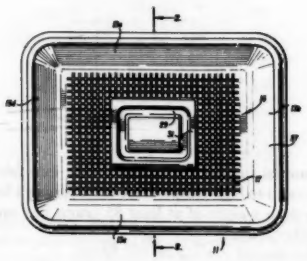
at least one outlet in said outer wall of the multi-channel body communicating with said continuous passages to permit said second fluid to exit said continuous passages.

4,533,585

LIQUID HOLDING PACKAGING TRAY

M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, N.Y.

Filed May 25, 1984, Ser. No. 614,089
Int. Cl.³ B32B *3/12*; B65D *1/34*
U.S. Cl. 428—116 **18 Claims**



1. A molded packaging tray comprising:

a generally rectangular bottom, and side walls extending upwardly from the periphery of said bottom, said side walls being of substantially the same height and integrally connected around the periphery of said bottom, said side walls and bottom being of an integrally molded construction, said bottom containing a plurality of liquid retaining cells having a size and configuration which enables said cells to retain liquids therein by capillary action, said bottom further containing at least one upstanding area having a height of a level which is greater than the level of the upper edges of said cells, said upstanding area assisting in maintaining a comestible above said upper edges of said cells.

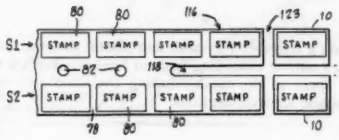
4,533,586

WEB OF ADHESIVE LABELS

Richard L. Roule, Westport; Peter J. Sorbo, Stamford, both of Conn., and John J. Kimball, Huntington Station, N.Y., assignors to American Bank Note Company, New York, N.Y.

Filed Mar. 8, 1984, Ser. No. 587,374
Int. Cl.³ B32B *3/24*
U.S. Cl. 428—137 **3 Claims**

1. For use in applying adhesive labels to end surfaces of each of a group of identically shaped and dimensioned articles of rectangular solid configuration arranged contiguously, with said end surfaces facing upwardly and coplanar, in a predetermined plurality of parallel horizontal rows each including a predetermined plurality of the articles aligned with the articles in each adjacent row, a unitary elongated web of flexible sheet material, constituting a supply of the labels, having one surface bearing an adhesive material and an opposite surface bearing a multiplicity of label imprints arranged in said predetermined



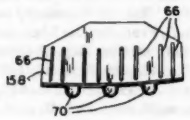
plurality of rows, the imprints in adjacent rows being aligned with each other, said rows of imprints extending lengthwise of the web and being spaced apart transversely of the web, the spacing between adjacent rows of imprints on the web being equal to a predetermined desired spacing between applied labels in adjacent rows of said articles in a group, said web further having an array of holes disposed at regular intervals along its length between adjacent rows of said imprints and in register with successive imprints in said last-mentioned rows.

4,533,587

CONNECTION INSULATORS

Eldon E. Moodie, and Richard D. Burns, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 268,529, May 29, 1981, Pat. No. 4,356,051, which is a division of Ser. No. 871,681, Jan. 23, 1978, abandoned.
This application Jul. 29, 1982, Ser. No. 403,271
Int. Cl.³ B32B *3/00*
U.S. Cl. 428—166 **3 Claims**



1. An improved connection insulator having a base portion and a retaining portion with a plurality of webs secured together for establishing a plurality of insulating compartments, wherein the improvement comprises: a base portion formed of polyethylene terephthalate; a retaining portion formed by a laminated material comprising at least one layer of polyethylene terephthalate and at least one layer of a polyamide insulating paper material; and fused portions established between the polyethylene terephthalate material of the base portions and the at least one layer of polyethylene terephthalate of the laminated material of the retaining portion for securing together the base portion and the retaining portion, and thereby establishing insulating compartments.

4,533,588

GROOVED PLASTIC BOARD AND METHOD OF MAKING SAME

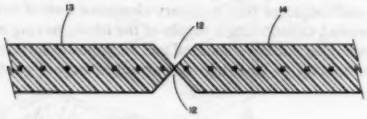
Howard R. Kraft, St. Paul, Minn., assignor to T. O. Plastics, Inc., Minneapolis, Minn.

Filed Sep. 4, 1984, Ser. No. 646,800
Int. Cl.³ B32B *3/30, 31/16*
U.S. Cl. 428—167 **14 Claims**

1. A product of the nature described, comprising:

a sheet of molded plastic material of substantial thickness having top and bottom surfaces with a thin sheet of mesh

embedded in said sheet between said top and bottom surfaces with the plastic material fused together through and substantially filling the mesh openings for tenaciously



holding together the mesh and plastic material; and elongated cutline extending from at least one surface through the sheet to the mesh forming the sheet into hingedly attached separate sections.

4,533,589

COMPOSITE MATERIALS

John H. Sewell, Aldershot, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 24, 1984, Ser. No. 633,880

Claims priority, application United Kingdom, Aug. 25, 1983, 8322919

Int. Cl.³ B32B *23/10, 31/12*

U.S. Cl. 428—174 **7 Claims**

4. A fibre reinforced composite material comprising at least one layer of woven or unidirectional carbon or aramid fibres impregnated with resin and bonded to at least one layer of wood veneer coated with and at least partially impregnated with resin.

4,533,590

CARRIER MATERIALS COATED WITH AMINO RESIN DISPERSIONS, AND THEIR FURTHER PROCESSING INTO LAMINATES

Peter Dörries, Frankfurt am Main, and Helmut Wahl, Düsseldorf, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main and Theodor Hymmen KG, Bielefeld, both of, Fed. Rep. of Germany

Division of Ser. No. 473,969, Mar. 10, 1983,. This application May 30, 1984, Ser. No. 615,374

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208728

Int. Cl.³ B32B *3/00, 7/00, 29/00*

U.S. Cl. 428—211 **4 Claims**

1. A carrier web coated with amino resin wherein at least one surface is resinated with a spreadable amino resin dispersion containing 70–90% by weight of a solid, modified melamine-formaldehyde resin having a melamine-formaldehyde ratio of from 1:1.5 to 1:2.2 and a water-dilutability within the range from 1:0.8 to 1:1.5 and 30–10% by weight of a liquid dispersant.

4,533,591

PROCESS FOR PRODUCING A DEVICE FOR REFLECTING ELECTROMAGNETIC ENERGY AND PRODUCT PRODUCED THEREBY

Paul O. Sorko-Ram, 1111 N. Centerville, Sturgis, Mich. 49091

Division of Ser. No. 440,912, Nov. 12, 1982,. This application Nov. 21, 1983, Ser. No. 553,497

Int. Cl.³ B32B *5/02*

U.S. Cl. 428—213 **4 Claims**

1. An electromagnetic energy reflector, comprising:

a first and second layer of thermoplastic resin material substantially transparent to said electromagnetic energy;

a sheet of electrically conductive material having a thickness substantially less than the thickness of either of said first or second thermoplastic resin layers positioned between said first and second layers; and

a quantity of electrically conductive particles embedded in at least one of said first and second layers, said particles being disposed in an electrically conductive relationship to said sheet and having a size and distribution density

effective to cooperate with said sheet to establish electrical continuity within said reflector and effectively reflect said electromagnetic energy.

4,533,592

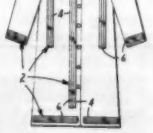
THERMALLY STABLE FLAME RETARDANT REFLECTIVE AND RETROREFLECTIVE TRIM

Wallace K. Bingham, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 2, 1984, Ser. No. 636,981

Int. Cl.³ G09F *13/16*

U.S. Cl. 428—213 **7 Claims**



1. A material suitable for incorporation into fabrics which will be exposed to high temperatures comprising a fire resistant fabric having a weight of at least 85 grams per square meter and characterized by:

(A) a fluorescent coating on the fabric;

(B) a flexible, drapable, stretchable, retroreflective sheeting covering a portion of the material and comprising a layer of transparent lens elements in optical connection with a reflecting means;

(C) the combined thicknesses of the fluorescent coating and any flammable part of the retroreflective sheeting being about 5 to 60 percent of the thickness of the fire resistant fabric.

4,533,593

ANTIREFLECTION COATING FOR POTASSIUM CHLORIDE

Takeo Miyata; Takuhiro Ono, and Takashi Iwabuchi, all of Kanagawa, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

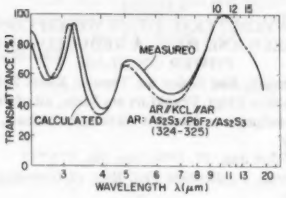
Filed Sep. 16, 1983, Ser. No. 533,273

Int. Cl.³ B32B *7/00, 15/04;* **G02B** *5/26*

U.S. Cl. 428—215 **2 Claims**

1. An antireflection coating for a potassium chloride substrate, said coating comprising a first arsenic trisulfide (As_2S_3)

layer, a lead fluoride (PbF_2) layer and a second arsenic trisulfide (As_2S_3) layer which are formed on at least one major



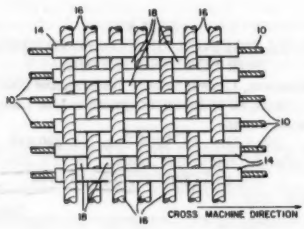
surface of the potassium chloride (KCl) substrate in the order named.

4,533,594

BATT-ON-MESH FELT EMPLOYING POLYURETHANE-COATED MULTIFILAMENTS IN THE CROSS-MACHINE DIRECTION

Robert D. Buchanan, Frankfurt, Ky., assignor to Porritts & Spencer, Wilson, N.C.

Filed Dec. 16, 1983, Ser. No. 562,074
Int. Cl.³ B32B *5/02*
U.S. Cl. 428—236 **13 Claims**



1. A papermakers' felt of the batt-on-mesh type wherein each strand of yarn woven in the cross-mchine direction of the mesh layer of said papermakers' felt comprises a yarn coated with a solid layer of polyurethane in such a manner that said yarn is hard, non-resilient and resistant to abrasion.

4,533,595

ABRASION-RESISTANT RESINOUS ARTICLES

Daniel R. Olson, and Timothy W. O'Donnell, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 11, 1984, Ser. No. 569,876
Int. Cl.³ B32B *27/30*
U.S. Cl. 428—336 **13 Claims**

1. A solid article of manufacture comprising (A) a resin base; (B) an abrasion-resistant surface coating on said resin base; and (C) a primer coating between said resin base and said surface coating, said primer coating comprising an addition copolymer of a monomer mixture comprising (C-1) a major proportion of at least one acrylic monomer and (C-2) a minor proportion of at least one ethylenically unsaturated mcnomer having the formula

$$CH_2=\underset{\displaystyle R^1}{\overset{|}{C}}-Z-X^1, \qquad (I)$$

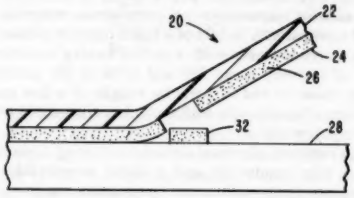
wherein R^1 is hydrogen or methyl, Z is a substantially inert linking group, and X^1 is an ultraviolet degradation-inhibiting moiety.

4,533,596

THERMAL MAGNETIC TRANSFER RIBBON

Thomas P. Besselman, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 28, 1983, Ser. No. 508,630
Int. Cl.³ B41M *5/26*
U.S. Cl. 428—341 **16 Claims**



1. A thermal magnetic ribbon for use in non-impact printing comprising a substrate and a transfer layer which is a mixture containing about 3% to 10% hydocarbon resin as a binder material, about 1.5% to 5% hydrocarbon oil, about 15% to 50% wax, about 12% to 50% magnetic pigment in a ratio of about 4:1 with the hydrocarbon resin, about 1% wetting agent, all by dry weight, and about 30% to 60% solvent by wet weight for solubilizing the mixture.

4,533,597

ADHESIVE FOR COMPOSITE YARN PRODUCT

Michaelene Dwulet, Lyndhurst, N.J., assignor to Multi-Tex Products Corp., Kearny, N.J.

Division of Ser. No. 362,717, Mar. 29, 1982, abandoned. This application Nov. 1, 1983, Ser. No. 547,696
Int. Cl.³ D02G *3/00*
U.S. Cl. 428—375 **17 Claims**

1. A composite yarn product comprising strands of a composite resinous laminate, said laminate having at least 3 film layers thereof, and consisting essentially of:

A. a central substrate comprising a colored cellulosic material having two opposed surfaces;

B. an outer thermoplastic film adhered to each of said opposed surfaces;

C. an adhesive composition adhering said substrate to the adjacent surfaces of said outer films, said adhesive composition applied to the adjacent surfaces of said outer films prior to the placement of said adjacent surfaces against the respective surfaces of said colored substrate, said adhesive composition consisting essentially of;

i. a first component, said first component comprising a resin material selected from copolymers of acrylonitrile and butadiene, and copolymers of butadiene and styrene, in an amount by weight of said adhesive composition of up to about 10%, and at least one organic solvent present in an amount by weight, based on said composition of about 10%; and

ii. a second component comprising a vinylchloride-vinylacetate copolymer, present in an amount by weight of from about 5% to about 10%, an epoxy resin present in an amount of about 5% by weight, and a solvent system for said second component present in an amount up to about 75% by weight of said adhesive composition;

iii. said first and said second components initially prepared individually, and said second component is dispersed in said first component; and

D. wherein the completed yarn product possesses an aggregate thickness of no greater than 2 mil.

4,533,598

EXTENDED POLYURETHANES

William J. Downey, Linden, and Melvin Brauer, East Brunswick, both of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Filed Nov. 18, 1983, Ser. No. 553,196
Int. Cl.³ C08K 5/01; C08L 75/04; H01B 3/30
U.S. Cl. 428—380 44 Claims

43. An insulated electrical device comprising a plurality of insulated wire conductors and a cured re-enterable cyclic olefin extended polyurethane gel composition comprising from about 8 to 49 parts by weight of a liquid reaction product of an organic polyisocyanate with a polyol having an equivalent weight of between about 230 and 6,000 in the presence of between about 92 and 51 parts by weight of a first extender comprising a liquid cyclic olefin which is compatible with the resulting polyurethane.

44. An insulated electrical device comprising a plurality of insulated wire conductors and a cured re-enterable cyclic olefin extended polyurethane gel composition consisting essentially of a liquid reaction product of an organic polyisocyanate with a polyol having an equivalent weight of between about 230 and 6,000 in the presence of a first extender comprising a liquid cyclic olefin which is compatible with the resulting polyurethane.

4,533,599

MICROCAPSULE AND PROCESS FOR THEIR PRODUCTION

Fumio Okumura, and Akira Kawai, both of Takasago, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,845
Claims priority, application Japan, Mar. 25, 1983, 58-51091
Int. Cl.³ B01J 13/02; B32B 27/42
U.S. Cl. 428—402.21 8 Claims

1. A process for producing microcapsules containing a hydrophobic material as a core material, the process comprising the steps of dispersing or emulsifying a hydrophobic material in the form of discontinuous microparticles in an acidic aqueous solution containing a partially esterified product of a styrene-maleic anhydride copolymer, the partially esterified product of a styrene-maleic anhydride copolymer being used in a quantity of 2 to 20 parts by weight relative to 100 parts by weight of the hydrophobic material, adding a melamine-formaldehyde precondensate to the dispersion or emulsion obtained, and subjecting the resuting mixture to reaction in an acidic phase with heating to form a shell film on each microparticle.

8. Microcapsules produced by the process defined in claim 1.

4,533,600

SEALANT SHEET MATERIAL

Raymond T. Coughlan, Darien, and Suzette M. Bojarski, Tinley Park, both of Ill., assignors to Daubert Coated Products Inc., Chicago, Ill.

Filed Apr. 26, 1984, Ser. No. 604,044
Int. Cl.³ B32B 27/38; C09J 7/02
U.S. Cl. 428—414 10 Claims

1. A low cost sheet material adapted for use as a substrate on which to cast sealants or adhesives, comprising: a supporting base layer formed of a highly calendered, smooth grade kraft paper; a continuous coating of a resin composition on each of the main surface areas of the kraft paper base layer, said resin composition consisting essentially of a nitrile rubber modified polyvinyl chloride; and a continuous film of a silicone release agent on the surface of at least one of said coatings of the resin composition.

4,533,601

POLYVINYLBUTYRAL FILMS WHICH CONTAIN PLASTICIZER AND HAVE A REDUCED ADHESIVE POWER ON GLASS

Hans D. Hermann, Bad Soden am Taunus; Klaus Fabian, Kriftel, and Joachim Ebigt, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 31, 1984, Ser. No. 575,712
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1983, 3303156
Int. Cl.³ C08L 29/14, 29/04; C08K 3/22, 5/17
U.S. Cl. 428—437 14 Claims

1. A method of reducing adhesion to glass of a thermoplastic polyvinylbutyral molding composition, which contains plasticizer and in which the polyvinylbutyral component contains 21–28% by weight of vinyl alcohol units (based on the polyvinylbutyral), by mixing constituents of the molding composition with an anti-adhesive agent combination of

(a) potassium hydroxide, potassium formate or potassium acetate in an amount corresponding to an alkali titer of between 10 and 200 (based on the polyvinylbutyral) and

(b) 0.005 to 0.5% by weight (based on the polyvinylbutyral) of a compound having a betaine structure.

4,533,602

MODIFIED POLYOLEFIN COMPOSITION USEFUL FOR BONDING MATERIALS

Yoichi Nakamura, Urawa; Shumei Watarai, and Shohta Matsuo, both of Tokyo, all of Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Mar. 19, 1984, Ser. No. 590,848
Claims priority, application Japan, Mar. 29, 1983, 58-51582
Int. Cl.³ C08K 3/26; B32B 9/04
U.S. Cl. 428—447 14 Claims

1. A modified polyolefin composition having excellent bonding properties comprising:

(A) 10% to 80% by weight of a modified polyolefin resin prepared by modifying a non-modified polyolefin resin consisting essentially of at least one member selected from the group consisting of (a) crystalline polypropylene homopolymers, (b) crystalline random and block propylene copolymers containing not more than 30% by weight of at least one member selected from the group consisting of ethylene, and α-olefins having 4 to 10 carbon atoms, (c) polyethylene homopolymers having a density of at least 0.93 g/cm^3, (d) random and block ethylene copolymers containing not more than 15% by weight of an α-olefin, and (e) mixtures of the polymers of (a), (b), (c) and (d) with not more than 50% by weight of the mixture of at least one polyethylene homopolymer having a density of at least 0.93 g/cm^3, with a modifying agent in an amount of from 0.01 to 5 parts by weight per 100 parts by weight of said non-modified polyolefin resin, said modifying agent consisting essentially of at least one unsaturated silane compound having a polar radical, in the presence of a modifying assistant consisting essentially of at least one organic peroxide compound at an elevated temperature;

(B) 5% to 50% by weight of a finely pulverized inorganic material consisting essentially of at least one member selected from the group consisting of heavy calcium carbonate and light calcium carbonate each in the form of particles having an average size of from 0.05 to 10 microns; and

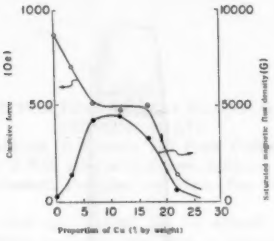
(C) 10% to 80% by weight of the non-modified polyolefin resin.

4,533,603

MAGNETIC RECORDING MEDIUM

Kazumasa Fukuda, and Yoshimi Kitahara, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,474
Claims priority, application Japan, Nov. 16, 1981, 56-182252
Int. Cl.³ G11B *5/64*
U.S. Cl. 428—458 **3 Claims**



1. A magnetic recording medium comprising a substrate of a polymer selected from the group consisting of polyester, polyimide and polyamide, and a thin magnetic metal layer formed on said substrate by a sputtering method, said magnetic metal layer consisting essentially an alloy of maganese and aluminum containing of 5-20% by weight of copper, the weight ratio of Mn:Al being within the range from 65:35 to 75:25, the thin magnetic metal layer having a thickness of from 0.1 to 1.0 μm, a minimum coercive force of 300 Oe, and a minimum saturated magnetic flux density of 1500 G, the sputtering being conducted at a low substrate temperature enabling use of said polymer substrate.

4,533,604

PRESSURE-SENSITIVE AND CONDUCTIVE RUBBER

Kazuhiro Honda, and Hiroshi Kuramochi, both of Komur Ina, Japan, assignors to Kokoku Rubber Industrial Company Limited, Japan

Filed Jun. 10, 1983, Ser. No. 503,039
Claims priority, application Japan, Jul. 9, 1982, 57-118639
Int. Cl.³ H01B *1/06*; B32B *27/32*
U.S. Cl. 428—521 **3 Claims**

1. In a pressure-sensitive conductive rubber material including filler particles selected from the group consisting of carbon black particles and metallic particles; an improved pressure-sensitive conductive rubber made of butadiene rubber and an organic liquid selected from the group consisting of naphthenic oil, liquid butadiene rubber and toluene, said organic liquid being compatible with said pressure-sensitive conductive rubber and impregnated into said pressure-sensitive conductive rubber.

2. The improved pressure-sensitive conductive as defined in claim 1 wherein said organic liquid substance is toluene and forms a flexible layer on a surface thereof.

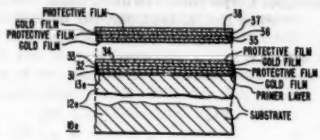
4,533,605

ARTICLE SUCH AS JEWELRY OR A WRISTWATCH COMPONENT HAVING COMPOSITE MULTI-FILM PROTECTIVE COATING

Richard A. Hoffman, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 612,492, May 21, 1984, abandoned, which is a division of Ser. No. 264,322, May 18, 1981, which is a continuation-in-part of Ser. No. 185,655, Sep. 9, 1980, abandoned. This application Dec. 3, 1984, Ser. No. 677,886
Int. Cl.³ C23C *15/00*
U.S. Cl. 428—635 **15 Claims**

1. An article that is composed of a base metal at least a portion whereof is covered by a composite coating comprising essentially a series of overlapped alternately-arranged thin films of (a) a metal that is different from the base metal and (b) a selected non-metallic material which is substantially transparent and of sufficient hardness to constitute an abrasion-resistant film,



the first film in the series comprising a film of said metal that is bonded to the base metal, and the last film in the series comprising an abrasion-resistant substantially transparent film of said non-metallic material which thus constitutes the outer surface of the coated portion of the article.

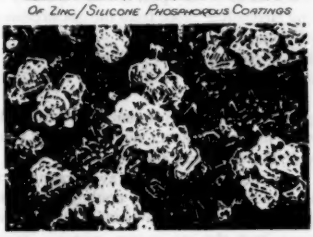
4,533,606

ELECTRODEPOSITION COMPOSITION, PROCESS FOR PROVIDING A Zn/Si/P COATING ON METAL SUBSTRATES AND ARTICLES SO COATED

Yu-Ling Teng, Bayside, N.Y.; Charles McCoy, Pearland; Francis DeFalco, Houston, both of Tex., and Richard Mayernick, North Merrick, N.Y., assignors to Kollmorgen Technologies Corp., Dallas, Tex.

Filed Aug. 16, 1984, Ser. No. 641,557
Int. Cl.³ B32B *15/04*; C25D *3/56*
U.S. Cl. 428—658 **19 Claims**

SCANNING ELECTRON MICROSCOPE PHOTOGRAPHS OF ZINC/SILICONE PHOSPHOROUS COATINGS



1. A method to provide a solution suitable for electrodepositing a coating comprising at least about 70% by weight of zinc, at least about 0.1% by weight of silicon, and at least about 0.5% by weight of phosphorus on a metallic substrate, the method comprising:

(a) contacting metallic zinc and silicon with phosphoric acid and an alkali metal hydroxide until between 0.4 and 1.3 moles of alkali metal hydroxide per mole of phosphoric acid has been added;

(b) allowing the reaction to proceed until gas evolution ceases;

(c) removing residual metallic zinc and silicon from the solution; and

(d) adjusting the pH to 2.5 or greater.

11. A method of electrodepositing a coating comprising at least about 70% by weight of zinc, at least about 0.1% by weight of silicon, and at least about 0.5% by weight of phosphorus on a metallic substrate, the method comprising:

(a) providing an aqueous solution for electrodeposition prepared according to claims 1, 5, 2, 6, 3, 4, 7, 10, 8, or 9;

(b) cleaning the metallic substrate sufficiently to achieve an adherent electrodeposit on the substrate;

(c) immersing the cleaned substrate in the electroplating solution; and

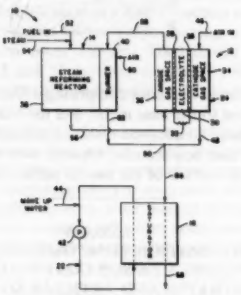
(d) electrodepositing the coating with the substrate as a cathode at a current density of at least 0.5 A/dm^2.

4,533,607

PROCESS FOR REMOVING ELECTROLYTE VAPOR FROM FUEL CELL EXHAUST GAS

Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 6, 1984, Ser. No. 678,611
Int. Cl.³ H01M 8/04
U.S. Cl. 429—13 6 Claims



1. In a process for operating a fuel cell comprising an electrolyte disposed between a pair of electrodes, wherein an oxidant gas is passed through the cell on the nonelectrolyte facing side of one electrode and a fuel gas is passed through the cell on the nonelectrolyte facing side of the other electrode, and wherein electrolyte evaporates into one or both of the reactant gas streams as they pass through the cell, the process of removing electrolyte vapor from the gas streams containing such vapor comprising:

continuously recirculating a mass of liquid water in a loop, including passing said mass of water through a saturator; and

passing the hot exhaust gas stream to be treated through the saturator in direct contact with the liquid water passing through the saturator, the circulating water absorbing heat from the gas stream and evaporating as a result of such heat absorption, thereby cooling the gas stream to a temperature below the dew point of the electrolyte to be removed from the gas stream, wherein the electrolyte condenses and dissolves into the circulating liquid, wherein the evaporated water is carried out with the gas stream, and wherein all of the acid dissolved into the circulating liquid remains in the liquid as it circulates, increasing the concentration of acid on a continuing basis.

4,533,608

ELECTROLYTIC PHOTODISSOCIATION OF CHEMICAL COMPOUNDS BY IRON OXIDE PHOTOCHEMICAL DIODES

Gabor A. Somorjai, and Christofer H. Leygraf, both of Berkeley, Calif., assignors to The Regents of The University of California, Berkeley, Calif.

Division of Ser. No. 416,351, Sep. 9, 1982, Pat. No. 4,460,443. This application May 24, 1984, Ser. No. 614,282
Int. Cl.³ H01M 6/36; C25B 1/00
U.S. Cl. 429—111 7 Claims

6. A method for generating an electrical potential and current utilizing visible light as the sole energy source comprising irradiating a p/n photochemical diode with visible light, said diode consisting of a silicon doped iron oxide semi-conductor electrode in insulated low resistance electrical contact with a magnesium doped iron oxide semi-conductor electrode.

4,533,609

SEAL FOR ELECTROCHEMICAL CELL

Arabinda N. Dey, Needham, and Noble E. Hamilton, Middleton, both of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Oct. 21, 1982, Ser. No. 435,844
Int. Cl.³ H01M 2/08, 2/12
U.S. Cl. 429—172 20 Claims

1. An electrochemical cell comprising a metal cell container having an anode, cathode and electrolyte disposed therein with said metal cell container having an open end with the walls adjacent said open end being tapered, characterized in that said cell is sealed with a metal cell top having a complementary substantially cofitting taper being seated with an interference fit on said tapered container wall with said container being an electrical terminal for one of said anode or cathode and said cell top being the electrical terminal for the other of said anode and cathode and wherein an insulating sealant film of minimal thickness is compressively held between said tapered container wall and said cofitting tapered cell top by said interference fit and wherein said container walls adjacent said open end are tapered inwardly and said metal cell top is cofittingly tapered outwardly to be seated with said interference fit over and around said tapered container walls.

4,533,610

METHOD OF MANUFACTURE OF A COLOR TELEVISION TUBE HAVING LOW SCREEN REFLECTANCE FOR AMBIENT LIGHT

Attilio Di Passio, Sora, and Antimo Pezzulo, Miravalle, both of Italy, assignors to Videocolor, Montrouge, France

Filed Jun. 21, 1984, Ser. No. 622,824
Claims priority, application France, Jun. 24, 1983, 83 10498
Int. Cl.³ G03C 5/00
U.S. Cl. 430—25 5 Claims

1. A method of depositing an antireflection layer of black graphite between the phosphor strips on the internal surface of the faceplate and on the faceplate flange of a color television tube, the steps comprising:

applying deionized water to an internal surface of the flange;

applying a photosensitive substance on the internal surfaces of the faceplate and flange;

exposing the substance on the faceplate to ultraviolet radiation to harden the substance at intended locations for phosphors, wherein the prior application of deionized water to the flange ensures the formation of a uniform film of hardened material on the flange by scattered ultraviolet radiation during ultraviolet exposure;

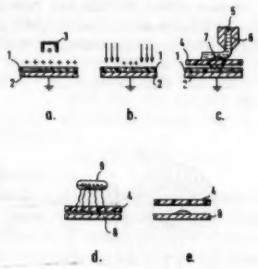
removing the non-hardened portions of the substance;
coating the internal surfaces of the faceplate and flange with graphite;
applying an oxidizing solution to the internal surface of the faceplate to destroy the hardened strips by chemical reaction; and
removing the destroyed strips and their graphite coating.

4,533,611

PROCESS FOR PREPARING A PLANOGRAPHIC PRINTING PLATE

Detlef Winkelmann, Wiesbaden, and Peter Padberg, Taunusstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 26, 1983, Ser. No. 488,697
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215940
Int. Cl.³ G03G *13/16, 13/28*
U.S. Cl. 430—49 **22 Claims**



1. A process for preparing a planographic printing plate by electrophotographic or electrographic means, comprising the steps of:
on a photoconductive or highly insulating layer which provides a first surface and a second surface, producing a charge image on said first surface;
applying a dielectric film as an intermediate support to said first surface of said photoconductive or insulating layer, whereby said charge image is covered by said intermediate support;
developing a toner image on the free surface of said intermediate support, said toner image corresponding to said charge image, by applying a liquid developer to said free surface of said intermediate support, said developer comprising an electrophoretically active liquid developer comprising thermoplastic, dispersed particles which (a) have a melting range from about 90° C. to 130° C. and (b) are comprised of at least one thermoplastic selected from the group consisting of a polyamide, polyethylene, a copolymer of styrene, and a copolymer of acrylate or methacrylate;
separating said intermediate support from said photoconductive or insulating layer;
transferring and fixing said toner image to the planographic printing plate by (i) applying said intermediate support to a planographic printing plate, such that said toner image is immediately adjacent to said planographic printing plate, (ii) applying heat such that said toner image is softened for melt transfer, and (ii) transferring said toner image by melt transfer to said planographic printing plate; and
separating said intermediate support from said planographic printing plate.

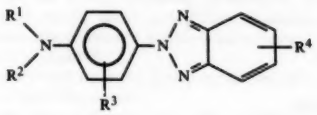
4,533,612

ELECTROPHOTOGRAPHIC RECORDING MATERIALS CONTAINING SPECIAL CHARGE CARRIER-TRANSPORTING COMPOUNDS

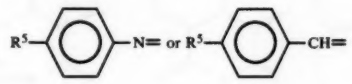
Heinz Eilingsfeld; Karl-Heinz Etzbach, both of Frankenthal; Gerhard Hoffmann, Otterstadt, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 489,186, Apr. 27, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 675,264
Int. Cl.³ G03G *5/06, 5/14*
U.S. Cl. 430—59 **14 Claims**

1. An electrophotographic recording material comprising an electrically conductive base, charge carrier-producing compounds and charge carrier-transporting compounds, which contains an effective amount, as charge carrier-transporting compounds, of one or more compounds of the formula (I)



where R^1 and R^2 are identical or different and are each hydrogen, alkyl, allyl, benzyl or unsubstituted or substituted phenyl, or R^1 and R^2 together are



where R^5 is NR^1R^2, R^3 is hydrogen, alkyl, alkoxy or halogen and R^4 is hydrogen, alkyl, alkoxy, vinyl, allyl, dialkylamino, nitro, cyano or acryloyl.

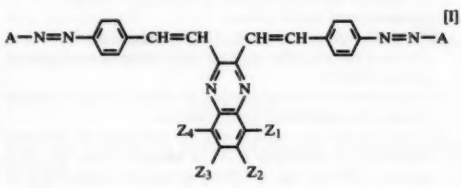
4,533,613

DISAZO COMPOUNDS AND PHOTOCONDUCTIVE COMPOSITION AS WELL AS ELECTROPHOTOGRAPHIC LIGHT SENSITIVE ELEMENT CONTAINING THE SAME

Kouichi Kawamura; Seiji Horie; Naonori Makino, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 8, 1983, Ser. No. 530,313
Claims priority, application Japan, Sep. 8, 1982, 57-156403
Int. Cl.³ G03G *5/06*
U.S. Cl. 430—78 **10 Claims**

1. A photoconductive composition comprising a disazo compound represented by general formula (I), (II) or (III)



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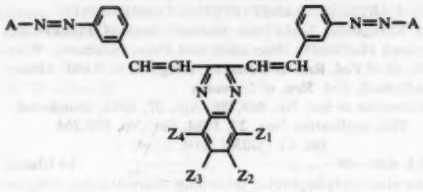
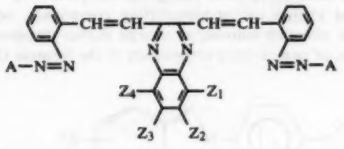
[II]

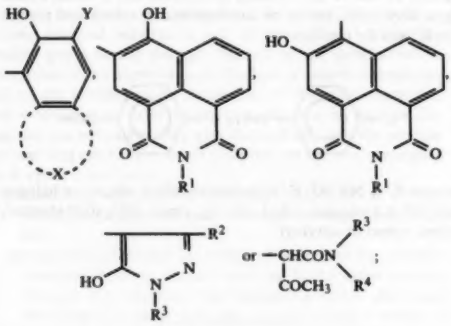


[III]



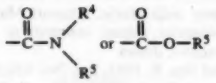
wherein:

A represents:



wherein X represents an atomic group necessary to complete an aromatic ring or a heterocyclic ring (said ring may be substituted or unsubstituted), by condensing with the benzene ring in the above formula to which a hydroxy group and Y are attached;

Y represents:



R^1 represents a hydrogen atom, an alkyl group, a phenyl group or a substituted group thereof;

R^2 represents a hydrogen atom, a lower alkyl group, a carbamoyl group, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, or a substituted or unsubstituted amino group;

R^3 and R^5 each represents an alkyl group, an aromatic ring group, a heterocyclic aromatic ring group or a substituted group thereof;

R^4 represents a hydrogen atom, an alkyl group, a phenyl group or a substituted group thereof;

Z_1, Z_2, Z_3 and Z_4, which may be the same or different represents a hydrogen atom, a halogen atom, an alkyl group, a nitro group, an alkoxy group, an alkoxycarbonyl group or an aryloxycarbonyl group.

4,533,614

HEAT-FIXABLE DRY SYSTEM TONER

Hiroshi Fukumoto, Kawasaki; Sukejiro Inoue, Yokohama; Masumi Sasakawa, Tokyo, and Shinji Doi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,548

Claims priority, application Japan, Jun. 1, 1982, 57-93568; Jul. 6, 1982, 57-118235; Jul. 7, 1982, 57-119065

Int. Cl.³ G03G *9/08, 13/12*

U.S. Cl. 430—99 **32 Claims**

1. A heat-fixable dry system toner powder comprising a colorast and in a binder resin a non-linearly modified low melting polyester having an acid value of 10 to 60 obtained from components containing (A) an alkyl-substituted dicarboxylic acid and/or an alkyl-substituted diol, (B) a trivalent or more polycarboxylic acid and/or a trivalent or more polyol, (C) an aromatic dicarboxylic acid, and (D) an etherated diphenol.

4,533,615

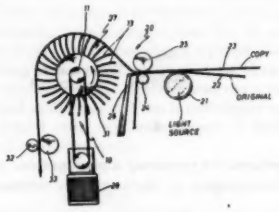
ABRASION DEVELOPMENT

Jonathan S. Arney, and Richard F. Wright, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Contin[illegible]-in-part of Ser. No. 554,813, Nov. 23, 1983, abandoned, wh[illegible] a division of Ser. No. 397,681, Jul. 13, 1982, Pat. No. 4,448,5[illegible] This application Oct. 29, 1984, Ser. No. 665,895

Int. Cl.³ G03C *1/68, 5/24*

U.S. Cl. 430—138 **7 Claims**



1. A method for developing a latent image in an imaging sheet having a photosensitive layer and a layer of a color developer, said photosensitive layer including microcapsules containing a photosensitive composition and a chromgenic material in the internal phase, comprising uniformly abrading said photosensitive layer such that said microcapsules rupture and image-wise release said internal phase.

4,533,616

DEVELOPER FOR ELECTROPHOTOGRAPHY OF TONER AND MICROENCAPSULATED ADDITIVE

Ichiro Ohsaki, Kawasaki; Tetsuo Hasegawa, Tokyo, and Koushi Suematsu, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1983, Ser. No. 497,831

Claims priority, application Japan, Jun. 1, 1982, 57-93569; Jun. 18, 1982, 57-105137

Int. Cl.³ G03G *9/16*

U.S. Cl. 430—110 **13 Claims**

1. A developer for electrophotography which comprises a toner and a microencapsulated additive capable of gradual release into said developer during electrophotographic development by destruction of the microcapsule wall, said additive enhancing development of an electrostatic image and comprising a flowability improver, a charge control agent, an electroconductivizing agent, an abrasive or a lubricant.

4,533,617

HEAT FIXING DEVELOPER OF CAPSULE STRUCTURE

Sukejiro Inoue, Yokohama; Hiroshi Fukumoto, Kawasaki; Masumi Sasakawa, Kamagaya, and Shinji Doi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 23, 1983, Ser. No. 497,181

Claims priority, application Japan, May 26, 1982, 57-89273; May 26, 1982, 57-89274; May 26, 1982, 57-89275; May 26, 1982, 57-89256

Int. Cl.³ G03G *9/08*

U.S. Cl. 430—111 18 Claims

1. A heat fixing developer of a capsule structure having the surface of a core particle, containing a binder resin having a crosslinked structure and a glass transition temperature of 60° C. or lower and a softening point of 50° to 130° C. and a colorant, coated with a vinyl type polymer having a glass transition temperature of 55° C. or higher, a softening point of 100° to 150° C., a Mw of 150,000 or more, and a Mw/Mn of 5 or more.

4,533,618

METHOD FOR TRANSFERRING TONER IMAGE

Hitoshi Nishihama, Hirakata; Katsuhiko Gotoda, Osaka; Minoru Motomura, Nara; Tadanobu Nakajima, Sakurai, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Continuation of Ser. No. 922,750, Jul. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 656,195, Feb. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 599,953, Jul. 29, 1975, Pat. No. 4,081,571. This application Mar. 31, 1980, Ser. No. 136,164

Claims priority, application Japan, Aug. 1, 1974, 49-88381; Jan. 29, 1976, 51-7917

Int. Cl.³ G03G *13/16*

U.S. Cl. 430—126 10 Claims

1. A method for transferring a toner image on the surface of an image-bearing member comprising the steps of developing with a conductive or semiconductive toner material a latent electrostatic image on the surface of the image-bearing member to form a conductive or semiconductive toner image, bringing the surface of a receptor member into contact with the toner image on the surface of the image-bearing member and simultaneously applying a corona discharge to the back surface of the receptor member; wherein the angle formed between the lines of electric force of the corona discharge and a line perpendicular to the receptor member does not exceed about 30 degrees, whereby scattering of the conductive or semi-conductive toner material is prevented and a high quality transfer image having a sharp contour is provided on the surface of the receptor member.

4,533,619

ACID STABILIZERS FOR DIAZONIUM COMPOUND CONDENSATION PRODUCTS

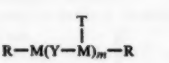
John E. Walls, Hampton; Major Dhillon, Hillsborough, and Trisha Bentley, Somerville, all of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 359,461, Mar. 18, 1982, abandoned. This application Sep. 12, 1983, Ser. No. 531,807

Int. Cl.³ G03C *1/60, 1/54;* G03F *7/08*

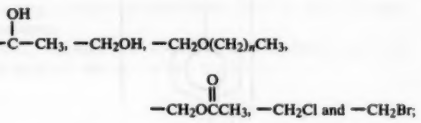
U.S. Cl. 430—157 11 Claims

1. A composition comprising a light sensitive diazonium compound condensation product in admixture with an acid selected from the group consisting of benzoic acid, m-nitro benzoic acid, p(p-anilino phenylazo)benzene sulfonic acid, 4,4'-dinitro-2,2'-stilbene disulfonic acid, itaconic acid and mixtures thereof, said acid being present in an amount sufficient to substantially improve the heat stability of said diazonium compound condensation product, wherein said diazonium compound condensation product is a condensation product of oligomers having the structure:



wherein:

R is selected from the group consisting of



n is an integer from 0 to 3;

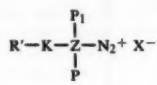
M is an aromatic radical of one or more compounds selected from the group consisting of aromatic hydrocarbons, diaryl ethers, diaryl sulfides, diaryl amines, diaryl sulfones, diaryl ketones and diaryl diketones;

m is 1 to about 9;

Y is selected from the group consisting of —CH_2— and —CH_2OCH_2—; and,

T is the same as R when Y is —CH_2— and is hydrogen when Y is —CH_2OCH_2—;

condensed with diazonium salts having the structure:



wherein:

Z is the benzene ring;

R' is selected from the group consisting of phenyl and C-1 to C-4 alkyl substituted phenyl;

K is selected from the group consisting of

—S—, —O—, and —CH_2—, or is absent;

P and P_1 may be the same or different and are selected from the group consisting of C1 to C4 alkyl, methoxy, ethoxy, butoxy, and H; and,

X is an anion.

2. A light sensitive reproduction material comprising a support and a reproduction layer thereon comprising the composition of claim 1.

4,533,620

LIGHT SENSITIVE CO-CONDENSATES

John E. Walls, Hampton, and Thomas A. Dunder, High Bridge, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 359,350, Mar. 18, 1982, abandoned. This application Aug. 2, 1983, Ser. No. 519,443

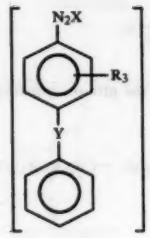
Int. Cl.³ G03C *1/54;* G03F *7/08;* C07C *113/04*

U.S. Cl. 430—157 27 Claims

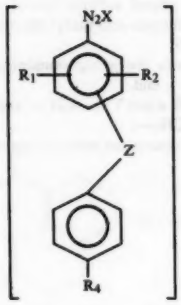
1. A photosensitive polycondensation co- or multi-polymer having one or more recurring units of the structure:

randomly or uniformly distributed along the copolymer chain, wherein

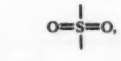
A is



and
B is

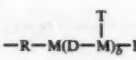


n ranges from 1 to 8;
m ranges from 1 to 8;
R_1 and R_2 are identical or different C_1–C_2 alkyl groups, C_1–C_4 alkoxy groups, halogen atoms or dimethylamino groups;
R_3 is selected from the group consisting of —H, —CH_3, —Cl, —OCH_3 or —OCH_2CH_3;
R_4 is selected from the group consisting of —H, —CH_3 or —Cl;
R_5 is a divalent linking group selected from the group consisting of —CH_2— or >$CHCH_3$;
X is an anion of the diazonium salt;
Y is selected from the group consisting of >NH, or

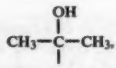


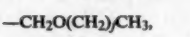
Z is selected from the group consisting of —S—; —O— or

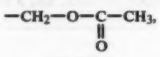
said photosensitive polycondensation product further characterized that the repeating B units are linked by an R_5 group when m is 2 or greater and the repeating A units are linked by an R_6 group when n is 2 or greater;
wherein R_6 is a divalent linking group selected from the group consisting of —CH_2—, >$CHCH_3$; or



and
R is selected from the group consisting of —CH_2— and >$C(CH_3)_2$;
wherein:
b is zero or an integer from 1 to about 9;
D is a divalent linking group selected from the group consisting of —CH_2— or —CH_2—O—CH_2—,
T is selected from the group consisting of







—CH_2Cl, —CH_2Br—H, or an R linking group, and is further characterized as being H— when D is —CH_2—O—CH_2—;
f is zero or an integer from 1 to 3; and
M is an aromatic radical selected from the group consisting of aromatic hydrocarbons, diaryl ethers, diaryl sulfides, diaryl disulfides, diaryl sulfones, diaryl amines, diaryl ketones and diaryl diketones; and
n and m are present at a ratio of 1:8–8:1.

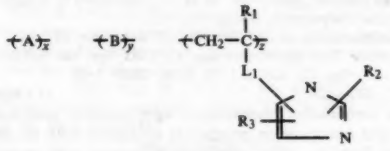
4,533,621

PHOTOGRAPHIC ELEMENT WITH IMADAZOLE DYE MORDANT

Satoru Ikeuchi; Yoshihiro Inaba; Hiroshi Shimazaki, and Tatsuhiko Kobayashi, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1984, Ser. No. 628,837
Claims priority, application Japan, Jul. 19, 1983, 58-132400; Jul. 26, 1983, 58-137293
Int. Cl.[3] **G03C** *1/40, 5/54, 1/84*
U.S. Cl. 430—213 **26 Claims**

1. A photographic element used in a color diffusion transfer process comprising an image receiving layer containing a polymer having monomer units represented by Formula I



I

wherein A is a copolymerizable monomer unit having at least two ethylenically unsaturated groups; B is a copolymerizable α,β ethylenically unsaturated monomer unit; R_1 is hydrogen or methyl; R_2 and R_3 are independently hydrogen, alkyl, or aryl; L_1 is a divalent combining group and $0.5 \leqq x \leqq 6.0$, $0 \leqq y \leqq 79.5$, and $20 \leqq z \leqq 99.5$, wherein the values of x, y, and z are expressed as copolymerization mole percentages.

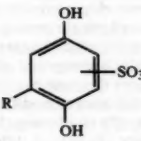
4,533,622

PHOTOGRAPHIC ELEMENT FOR COLOR DIFFUSION TRANSFER PROCESS CONTAINING HYDROQUINONE SULFONATES

Osamu Takahashi, and Mitsugu Tanaka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 9, 1984, Ser. No. 598,099
Claims priority, application Japan, Apr. 7, 1983, 58-61287
Int. Cl.³ G03C 1/40, 51/54
U.S. Cl. 430—218 13 Claims

1. A photographic element for a color diffusion transfer process comprising a support having thereon at least one silver halide emulsion layer and associated therewith a non-diffusible redox compound capable of releasing a diffusible dye or a precursor thereof as the result of treatment with an alkaline processing solution in the presence of a silver halide developing agent after exposure to light, an image-receiving element, and a processing element comprising a viscous alkaline processing solution, said alkaline processing solution containing a compound represented by the following general formula (I):



(I)

wherein R represents an alkyl group, an alkoxy group, an aromatic group or an alkylthio group, and each of these groups has 12 or less carbon atoms; and M represents a cation.

4,533,623

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS FOR PLATE MAKING AND METHOD OF REDUCTION TREATMENT FOR THEM

Yukihide Urata; Shigenori Moriuchi; Taku Nakamura, and Masashi Ogawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 415,297, Sep. 7, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,105
Claims priority, application Japan, Sep. 7, 1981, 56-140669
Int. Cl.³ G03F 7/02, 7/00; G03C 1/76, 1/30
U.S. Cl. 430—309 17 Claims

1. A method of reduction treatment for a silver halide light-sensitive material for plate making, comprising the steps of:

providing a silver halide photographic light-sensitive material for plate making comprising a support base having thereon a sensitive silver halide emulsion layer and at least one insensitive upper layer having a melting time longer than the melting time of the sensitive silver halide emulsion layer, said at least one insensitive upper layer having been hardened by a polymeric hardener;

exposing the silver halide photographic light-sensitive material;

developing the exposed material in order to form silver images; and

carrying out reduction treatment of the developed silver images.

4,533,624

METHOD OF FORMING A LOW TEMPERATURE MULTILAYER PHOTORESIST LIFT-OFF PATTERN

John E. Sheppard, Cornwells Heights, Pa., assignor to Sperry Corporation, New York, N.Y.

Filed May 23, 1983, Ser. No. 497,364
Int. Cl.³ G03C 5/00, 5/16
U.S. Cl. 430—312 4 Claims

1. A method of forming a low temperature multilayer photoresist lift-off pattern below 70° C. comprising:

providing a substrate,

applying a positive photoresist bottom layer on said substrate,

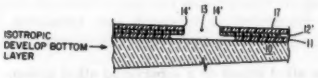
soft baking below 70° C. said positive photoresist bottom layer,

exposing said positive photoresist bottom layer,

applying a negative photoresist intermediate layer on said bottom layer,

providing a positive photoresist top layer on said intermediate layer,

masking, exposing and developing said top layer to provide an accurate aperture in said top layer.



plasma etching an extended accurate aperture through said intermediate layer and partially etching into said bottom layer to expose said bottom layer in said extended aperture,

isotropically developing said exposed bottom layer of said positive photoresist for a predetermined amount of time to provide a laterally extending deep undercut lift-off pattern under said intermediate layer, and

rinsing and drying said substrate and said three layers to provide a deep accurate three layer lift-off pattern for precise deposition of metal through said extended accurate aperture.

4,533,625

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Seiji Ichijima, and Takeshi Hirose, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 26, 1984, Ser. No. 593,209
Claims priority, application Japan, Mar. 25, 1983, 58-50001
Int. Cl.³ G03C 7/26, 7/32
U.S. Cl. 430—552 10 Claims

1. A color photographic light-sensitive material which contains a photographic coupler having a naphthalene nucleus in the bonding position other than the coupling position, wherein the naphthalene nucleus contains at least one hydroxyl group and at least one sulfonyl group as a substituent or contains at least one hydroxyl group and at least one sulfinyl group as a substituent.

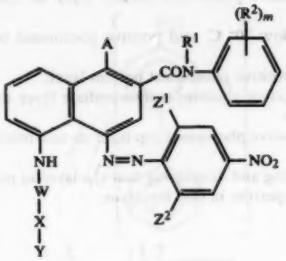
4,533,626

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL WITH 4-(PARANITROPHENYLAZO)NAPHTHOL DYES

Shigetoshi Ono; Toru Harada; Hirohisa Suzuki; Mitsugu Tanaka, and Shigeru Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 27, 1984, Ser. No. 635,085
Claims priority, application Japan, Jul. 27, 1983, 58-137226
Int. Cl.³ G03C 1/40, 5/54
U.S. Cl. 430—562 22 Claims

1. A silver halide photographic light-sensitive material containing a compound represented by formula (I)



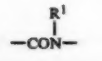
(I)

wherein

R^1 is an alkyl group or a substituted alkyl group;

R^2 is $-NHSO_2R^{2'}$ [wherein $R^{2'}$ is a substituted or unsubstituted alkyl group, an aryl group, a heterocyclic ring, or

(wherein D and D' may be the same or different and are each a hydrogen atom or an alkyl group)], or $-SO_2N-H-R^{2''}$ (wherein $R^{2''}$ is a hydrogen atom, a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group), and may be positioned at any of the ortho-, meta-, and para-positions relative to the



group;

m is an integer of 1 or 2;

W is $-SO_2-$ or $-CO-$;

X is a divalent connecting group represented by the formula $-R^3-L_n-R^{3'}{}_p-$ (wherein R^3 and $R^{3'}$ may be the same or different, and are each a substituted or unsubstituted alkylene group, a substituted or unsubstituted arylene group, or a substituted or unsubstituted aralkylene group; L is a divalent group selected from an oxy group, a carbonyl group, a carboxyamido group, a carbamoyl group, a sulfonamido group, a sulfamoyl group, a sulfinyl group, and a sulfonyl group; and n and p are each 0 or an integer of 1);

Y is a redox center capable of releasing a diffusible dye on undergoing a self-cleavage as a result of a redox reaction;

Z^1 is a halogen atom, a cyano group, a nitro group, a trifluoromethyl group, an alkyl group, an alkoxy group, a carboxyl group, a carboxylic acid ester group represented by the formula $-COOR^4$ (wherein R^4 is a substituted or unsubstituted alkyl group, or a substituted or unsubstituted phenyl group), a fluorosulfonyl group, a substituted or unsubstituted phenoxysulfonyl group, a group represented by the formula $-SO_2NR^5R^6$ (wherein R^5 is a hydrogen atom, a substituted or unsubstituted alkyl group; R^6 is a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted aryl group; and R^5 and R^6 may be combined together directly or through an oxygen atom to form a ring), a group represented by the formula $-CONR^5R^6$ (wherein R^5 and R^6 are the same as defined above), a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted aralkyl group, or a substituted or unsubstituted phenylsulfonyl group;

Z^2 is a hydrogen atom, a halogen atom, a nitro group, a cyano group, or a trifluoromethyl group; and

A is a hydroxyl group or a group forming a hydroxyl group upon decomposition.

4,533,627

PROCESS FOR THE PREPARATION OF A SILVER HALIDE EMULSION

Andrew W. Yates, Knutsford; Brian D. Harradine, Macclesfield, and Michael A. Wraith, Stretford, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Jul. 18, 1983, Ser. No. 515,311

Claims priority, application United Kingdom, Jul. 23, 1982, 8221359

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—567 **6 Claims**

1. A process for the preparation of a silver halide emulsion, which comprises (1) preparing a seed emulsion containing a substantially monodispersed population of silver halide crystals in a reaction vessel, (2) growing said seed emulsion by increasing the addition of silver and halide salts at such a rate as to maintain the substantial monodispersity of the silver halide crystals (3) transferring a predetermined volume of the medium containing said monodispersed silver halide crystals to a holding vessel, where no physical ripening occurs, (4) carrying out a further growth on the silver halide crystals remaining in the reaction vessel, which comprises effecting increased growth of said crystals under the same conditions as defined in step (2) to produce a population of monodispersed silver halide crystals on increased size, (5) combining the populations of monodispersed silver halide crystals of different means size, and then (6) carrying out the steps required to produce a fully sensitized and concentrated silver halide emulsion.

4,533,628

COLONY HYBRIDIZATION METHOD

Renata Maas, Hastings, N.Y., assignor to New York University, New York, N.Y.

Filed Aug. 3, 1983, Ser. No. 519,842

Int. Cl.³ C12Q *1/68*; C12P *19/34*; C12N *1/20, 1/06*

U.S. Cl. 435—6 **9 Claims**

1. A colony hybridization method for detecting a specific DNA sequence comprising the following steps for performing the specified acts:

growing bacterial colonies on agar and replicating them onto filter paper,

steaming said colonies in the presence of alkali on said paper in order to lyse said colonies on said paper and release their DNA,

fixing said DNA to said paper in situ,

hybridizing DNA containing said specific sequence to a labelled DNA containing said specific sequence, and

detecting said hybridized DNA containing said specific sequence.

4,533,629

SIMULTANEOUS CALIBRATION HETEROGENEOUS IMMUNOASSAY

David J. Litman, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 255,022, Apr. 17, 1981, Pat. No. 4,391,904, which is a continuation of Ser. No. 106,620, Dec. 26, 1979, Pat. No. 4,299,916. This application May 4, 1982, Ser. No. 374,849

Int. Cl.³ G01N *33/54*

U.S. Cl. 435—7 **4 Claims**

1. In a method for determining the presence in a sample of an analyte, which analyte is a member of a specific binding pair ("mip") consisting of ligand and receptor ("antiligand"),

said method employing a signal producing system having at least two enzymes, including one enzyme bound to a mip ("enzyme-bound-mip"), and a solute dye precursor which is catalytically transformed to an insoluble dye by one of

said enzymes bound to a mip-containing measurement first surface, said insoluble dye producing a change in a detectable signal at said first surface in proportion to the amount of analyte, where said mip at said first surface provides for binding of enzyme-bound-mip through mip complex formation to said first surface, and contacting of said first surface with said sample and said enzyme-bound-mip results in binding of said enzyme-bound-mip to said first surface in proportion to the amount of analyte in said sample,

the improvement which comprises:

during said contacting, having adjacent to said first surface, a calibration second surface to which anti-enzyme receptor is bound in a pre-determined amount and to which enzyme of said enzyme-bound-mip becomes bound through mip complex formation in an amount which provides substantially predetermined ratios to the amount of enzyme-bound-mip bound to said first surface, whereby the ratio of the change in signal at said second surface to the change in signal at said first surface is related to the amount of analyte in said sample.

4,533,630

TOXINS AND ANTIBODIES OF *C. DIFFICILE*

Tracy D. Wilkins, 305 Neil St., Blacksburg, Va. 24060, and David M. Lyerly, 37 Radford Village, Radford, Va. 24141

Filed Sep. 13, 1982, Ser. No. 417,379

Int. Cl.³ G01N *33/54;* C12Q *1/42;* C07G *7/00*

U.S. Cl. 435—7 **38 Claims**

1. In an assay process for toxin A of *C. difficile* wherein an analyte containing toxin A is contacted with an antibody, the improvement comprising:

contacting said analyte with monospecific antibody for toxin A of *C. difficile* to bind only toxin A to said mono-specific antibody.

4,533,631

FERMENTATION PROCESS FOR PREPARATION OF ANTIBIOTIC BU-2517

Hiroshi Kawaguchi, Tokyo; Masataka Konishi, Yokohama; Koko Sugawara, Wako, and Koji Tomita, Kawasaki, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

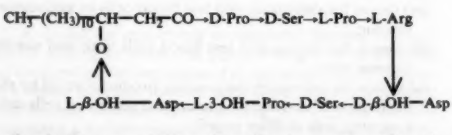
Division of Ser. No. 339,355, Jan. 15, 1982, Pat. No. 4,409,210. This application Mar. 25, 1983, Ser. No. 478,751

Int. Cl.³ C12P *21/02;* C12N *1/20*

U.S. Cl. 435—70 **4 Claims**

1. A process for producing the peptide antibiotic Bu-2517 which comprises cultivating Empedobacter sp. ATCC 31962 or a Bu-2517-producing mutant thereof under submerged aerobic conditions in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen until a substantial amount of Bu-2517 is produced by said organism in said culture medium and then recovering the Bu-2517 antibiotic from the culture medium.

4. A biologically pure culture of the microorganism Empedobacter sp. strain G393-B445 (ATCC 31962), said culture being capable of producing the antibiotic Bu-2517 of the formula



wherein Pro represents proline, Ser represents serine, Arg represents arginine, β-OH-Asp represents threo-β-hydroxyaspartic acid and 3-OH-Pro represents trans-3-hydroxyproline in a recoverable quantity upon cultivation in an aqueous nutrient medium.

4,533,632

PRODUCTION OF A CEPHALOSPORIN BY FERMENTATION

Alan Smith, Ulverston, and Peter J. Bailey, Sparkbridge, both of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 171,929, Jul. 18, 1980, abandoned. This application Aug. 6, 1982, Ser. No. 406,039

Claims priority, application United Kingdom, Jul. 19, 1979, 7925283

Int. Cl.³ C12P *35/00, 35/06*

U.S. Cl. 435—47 **9 Claims**

1. A process for the preparation of desacetyl cephalosporin C which comprises fermenting a cephalosporin C-producing microorganism in the presence of an amount of an acetylesterase enzyme effective to convert substantially all the cephalosporin C produced into desacetyl cephalosporin C before non-enzymic degradation of the cephalosporin C occurs.

4,533,633

PROCESS AND APPARATUS FOR ISOMERIZING GLUCOSE TO FRUCTOSE

Günter Weidenbach, Hanover; Dirk Bonse, Arpke/Lehrte, and Boris Meyer, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,296

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148603

Int. Cl.³ C12P *19/24;* C12N *11/14;* C12M *1/40*

U.S. Cl. 435—94 **25 Claims**

1. A process for the preparation of a solution containing a glucose and fructose, comprising the steps of:

(a) contacting a glucose-containing solution with porous particles consisting essentially of SiO_2 or aluminum silicate; and

(b) thereafter, converting glucose contained in said solution to fructose by contacting the glucose-containing solution with a catalyst having glucose isomerase activity, said catalyst consisting essentially of glucose isomerase attached to a carrier comprising porous particles consisting essentially of SiO_2, wherein the weight ratio of catalyst in said contacting step (b): particles in said contacting step (a) is between about 3:1 and 1:3.

21. Apparatus for carrying out a process for the preparation of a solution containing glucose and fructose from a starting solution containing glucose, comprising a reactor vessel containing a catalyst consisting essentially of glucose isomerase attached to a carrier comprising porous particles consisting essentially of SiO_2, and a pre-column connected to the inlet of said reactor vessel and containing porous particles consisting essentially of SiO_2 or aluminum silicate the weight ratio of catalyst in the reactor vessel:particles in the pre-column being between about 3:1 and 1:3.

4,533,634

TISSUE CULTURE MEDIUM

Reynaldo L. Maldonado, and Kenneth A. Rosanoff, both of Seguin, Tex., assignors to AMF Inc., White Plains, N.Y.

Filed Jan. 26, 1983, Ser. No. 461,016

Int. Cl.³ C12N *5/00, 5/02;* A61K *35/14;* A23J *1/06*

U.S. Cl. 435—240 **9 Claims**

1. A process for producing a growth factor containing serum having a γ-globulin content of between about 0.1–1.0 g/dl, and of 50–100 mg/dl of cholesterol comprising the steps of:

(a) adding ammonium sulfate to natural bovine serum to 15–30% saturation to give a first solids fraction and a first supernatant;

(b) separating said first solids fraction from said first supernatant;

(c) adding ammonium sulfate to said first supernatant to 35–45% saturation to give a second solids fraction and a second supernatant;

(d) separating said second solids fraction from said second supernatant;
(e) combining said first solids fraction and said second supernatant; and
(f) desalinating said first solids fraction and said second supernatant, either before or after said combining.

4,533,635
PROCESS FOR STIMULATING THE GROWTH OF EPIDERMAL CELLS

Isabelle Guédon born Saglier; Denis Barritault, both of Paris; Yves Courtois, Gif sur Yvette; Cristina Arruti, and Michel Prunieras, both of Paris, all of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

PCT No. PCT/FR80/00118, § 371 Date Feb. 18, 1981, § 102(e) Date Feb. 18, 1981, PCT Pub. No. WO81/00260, PCT Pub. Date Feb. 5, 1981
PCT Filed Jul. 10, 1980, Ser. No. 237,153
Claims priority, application France, Jul. 13, 1979, 79 18282
Int. Cl.³ C12N *5/00*
U.S. Cl. 435—240 **14 Claims**

1. A process for stimulating the growth of epiderm cells, which comprises contacting the epiderm cells with an aqueous saline extract of ocular tissue (RE).

4,533,636
MEDIUM FOR PLANT PROTOPLAST CULTURE

Ning-Sun Yang, Verona, Wis., assignor to Agracetus Madison Corporation, Middleton, Wis.

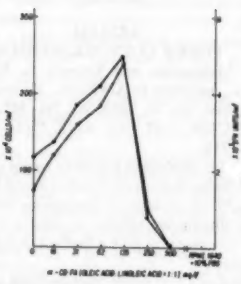
Filed Aug. 25, 1983, Ser. No. 526,496
Int. Cl.³ A01B *79/00*; A01C *1/00*; C12N *5/00, 5/02*
U.S. Cl. 435—240 **10 Claims**

1. In a medium for the in vitro isolation and maintenance of plant protoplast cultures including buffer salts, plant nutrients, sugar and plant hormones in aqueous solution wherein the improvement comprises an addition to the medium of a growth promoting amount of mammalian blood serum which has been heat treated to render said serum essentially free of potentially phytotoxic biological substances therefrom.

4,533,637
CULTURE MEDIUM

Isao Yamane, No. 6-6-20, Minami, Yagiyama, Sendai-shi, Miyagi-ken; Mikio Kan, Sendai, and Yoshiki Minamoto, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo and Isao Yamane, Sendai, both of, Japan

Filed May 18, 1982, Ser. No. 379,369
Claims priority, application Japan, May 28, 1981, 56-81600
Int. Cl.³ C12N *5/00*; C12R *1/91*
U.S. Cl. 435—240 **19 Claims**

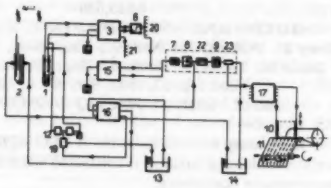


1. In an animal cell culture comprising animal cells and a medium comprising a carbon source, a nucleic acid precursor, amino acids, vitamins, minerals, a lipophilic nutrient, and serum or serum albumin in amounts sufficient to allow the growth of said animal cell culture, an improvement which comprises replacing all serum and serum albumin with α-, β- or γ-cyclodextrin or a mixture of said cyclodextrins.

4,533,638
BLOOD TYPING APPARATUS

István Murányi; Lászlóné Balázs; József Molnár; Ferencné Burda; Mária Metzler, and Lajos Szerdahelyi, all of Budapest, Hungary, assignors to Labor Müszeripari Müvek, Esztergom, Hungary

Continuation-in-part of Ser. No. 353,654, Mar. 1, 1982, abandoned, which is a continuation of Ser. No. 208,993, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 85,218, Oct. 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 941,326, Sep. 11, 1978, abandoned, which is a continuation of Ser. No. 748,053, Dec. 6, 1976, abandoned. This application Apr. 28, 1983, Ser. No. 489,660
Claims priority, application Hungary, Dec. 30, 1975, LA 881
Int. Cl.³ C12M *1/40*
U.S. Cl. 435—288 **4 Claims**



1. In a device for simultaneous multiple blood typing comprising a blood sample container for holding a blood sample containing sample blood cells and sample plasma, a plurality of sample blood cell testing arrangements and a plurality of sample plasma testing arrangements; each member of said plurality of sample blood cell testing arrangements comprising:
(a) an enzyme storage container;
(b) an enzyme mixer for mixing sample blood cells with enzyme;
(c) means for delivering sample blood cells from said blood sample container to said enzyme mixer;
(d) means for delivering enzyme from said enzyme container to said enzyme mixer;
(e) a first reactor;
(f) means for delivering the mixture of enzyme and sample blood cells from said enzyme mixer to said first reactor;
(g) reagent plasma storage means;
(h) means for delivering said reagent plasma to said first reactor; and
(i) means for delivering the reaction product from said first reactor onto a moving web of filter paper; each member of said plurality of sample plasma testing arrangements comprising:
(j) a second reactor;
(k) means for delivering sample plasma from said blood sample container to said second reactor;
(l) a reagent container containing test blood cells;
(m) means for delivering said test blood cells to said second reactor;
(n) means for mixing said test blood cells with said sample plasma; and
(o) means for delivering the reaction product formed by the interaction of said sample plasma and test blood cells onto a moving web of filter paper;
the improvement comprising said enzyme mixer having a flatened tubular member twisted about its longitudinal axis so that the tubular member has varying cross section; said first and second reactors each comprising a unitary tubular reactor-sedimentor consisting of a tubular first mixing portion bent in

a helix around its horizontal axis and a tubular first sedimentor portion which is unitary with the first mixing portion and bent in a helix around its vertical axis; a tubular saline mixing portion for mixing the enzyme and blood cells of the sample with saline wash solution to prevent false agglutination; the saline mixing portion being unitary with the first sedimentor portion and bent in a helix around its vertical axis, and a tubular second sedimentor portion unitary with the saline mixing portion and bent in a helix about its vertical axis; said device further including means for removing agglutinate from the second sedimentor portion of the tubular reactor-sedimentor which agglutinate indicates of a positive test result; means for maintaining rate of flow in the device substantially contant; volume adjustment means communicating with the means for removing the agglutinate, the volume adjustment means adjusting flow volume so that agglutinate is removed and deposited onto a moving filter paper simultaneously and in a single line from the terminal ends of said plurality of sample blood cell testing arrangements and said plurality of said sample plasma testing arrangements.

4,533,639
TEST METHOD FOR PHOSPHATE COATINGS

Ryuji Kojima, and Akiko Yazaki, both of Tokyo, Japan, assignors to Parker Chemical Company, Madison Heights, Mich.

Filed Jun. 20, 1984, Ser. No. 622,431
Claims priority, application Japan, Jun. 21, 1983, 58-110254
Int. Cl.³ G01N *1/00, 33/20*
U.S. Cl. 436—2 **4 Claims**

1. A method for determining the coating weight and composition of a zinc phosphate coating on a ferrous metal surface, comprising:

(a) stripping the coating for a known period from a known area of the surface using a solution comprising sodium hydroxide and triethanolamine;

(b) colorimetrically determining the iron content of the stripping solution;

(c) colorimetrically determining the phosphate content of the stripping solution;

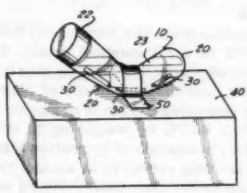
(d) determining the weight ratio of hopeite/phosphophillite; and

(e) determining the coating weight.

4,533,640
ACCUMULATED THERMAL EXPOSURE RESPONDER AND METHOD OF USE

Jules A. Shafer, 1038 Baldwin, Ann Arbor, Mich. 48104

Filed Feb. 21, 1984, Ser. No. 581,981
Int. Cl.³ G01N *21/78, 21/82*
U.S. Cl. 436—2 **13 Claims**

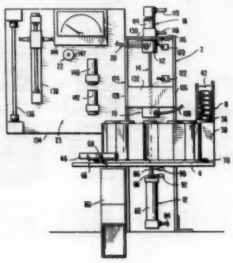


1. A device for monitoring accumulated thermal exposure and for affixing to perishable goods having a given shelf-life and for signaling the expiration of the given self-life by producing a visible indicator reaction after a predetermined accumulated thermal exposure corresponding to the given shelf-life comprising a sealed container and reagents in said container, wherein the reagents in said container are viewable and include (1) a reactant yielding reagent that is capable of producing an amine reactant during thermal exposure and (2) an indicator yielding reagent that, during thermal exposure, is capable of reacting with the amine to produce a visible indicator reaction after a predetermined accumulated thermal exposure.

4,533,641
AUTOMATIC CHEMICAL ANALYSIS METHODS

John K. Holt, Ft. Pierce, Fla., assignor to Harbor Branch Foundation, Inc., Ft. Pierce, Fla.

Division of Ser. No. 400,442, Jul. 21, 1982, Pat. No. 4,454,095.
This application Apr. 16, 1984, Ser. No. 600,908
Int. Cl.³ G01N *21/00, 35/04*
U.S. Cl. 436—43 **3 Claims**



1. In a method for automatically analyzing liquid samples contained in fracturable ampoules for determination of content of specific gas in the liquid sample including positioning fracturable sample containing ampoules in a closed chamber, breaking the fracturable sample containing ampoules inside the closed chamber, and transporting at least a component of the samples to a means for analyzing a specific gas contained in the samples, the improvement which comprises the steps of:

a. encasing each ampoule in a separate tubular sleeve,

b. forming a fluid-tight seal between the outside of each encased ampoule and the inside of each sleeve,

c. inserting a sleeve encased ampoule in a closed chamber having a test gas inlet and a test gas outlet,

d. forming a fluid-tight seal between said chamber and the inserted encased ampoule,

e. fracturing the ampoule within said chamber while maintaining said seal between said chamber and said encased ampoule, and

f. passing test gas into said opened ampoule via said gas inlet and removing gas from said chamber via said gas outlet.

4,533,642
METAL ANALYSIS FOR ACID-SOLUBLE ELEMENTS

John H. Kelly, Burlington, Canada, assignor to Stelco Inc., Hamilton, Canada

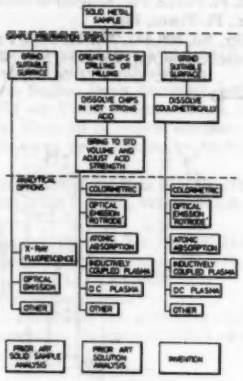
Filed Apr. 26, 1982, Ser. No. 372,079
Claims priority, application Canada, Apr. 2, 1982, 400398
Int. Cl.³ G01N *33/20*
U.S. Cl. 436—78 **15 Claims**

1. A method for rapidly determining the concentration of a variable concentration acid-soluble material in a sample of an acid-soluble metal, which comprises:

coulometrically dissolving a predetermined amount of said acid-soluble metal from said sample to form a solution containing said predetermined amount of acid-solubilized metal and also containing a variable amount of said variable concentration acid-soluble material proportional to the amount thereof in said sample,

said coulometric dissolving being effected rapidly in an electrolytic cell containing a dilute aqueous solubilizing agent having a concentration insufficient to effect dissolution of the sample in the absence of electrolytic assistance by circulating the acidic solubilizing agent through an electrolysis zone between the sample acting as the amode

electrode and the cell cathode to flush gaseous products of electrolysis from said electrolysis zone while maintaining high current density in the electrolysis zone during said coulometric dissolving, and



analytically determining the amount of said variable concentration acid-soluble material in said solution in relation to said predetermined amount of metal to provide a value proportional to the concentration of said variable concentration acid-soluble material in said sample.

4,533,643

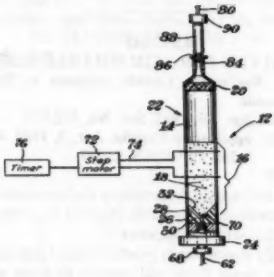
METHOD FOR THE BATCH PREPARATION OF SAMPLE ALIQUOTS BY SOLVENT EXTRACTION AND SEPARATION OF SOLUBLES FROM NONSOLUBLE PARTICULATE

David R. Bell, Vernal, Utah, and Theodore E. Miller, Jr., Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 423,343, Sep. 24, 1982, abandoned, which is a continuation of Ser. No. 220,551, Dec. 29, 1980, abandoned. This application Jul. 9, 1984, Ser. No. 629,025

Int. Cl.³ G01N 1/10

U.S. Cl. 436—178 **3 Claims**



1. Method for the batch preparation of sample aliquots by solvent extraction and separation of soluble species from sample comprising nonsoluble particulate, which comprises:

(a) adding a batch quantity of said sample to a receptacle having a sample receiving space which communicates with a fluid-permeable filter, the filter being disposed remotely from the sample;

(b) adding a batch quantity of liquid solvent to the sample receiving space;

(c) injecting a stream of pressurized gas into the sample receiving space to slurry the solvent with the sample;

(d) inverting the sample receptacle to transfer the slurry into filtering contact with the filter;

(e) filtering the liquid phase of the slurry through the filter, and

(f) collecting a metered amount of the filtered liquid phase to prepare a sample aliquot containing dissolved species extracted from the sample.

4,533,644

MORTAR

Cecil M. Jones, Worcester, Mass., assignor to Norton Company, Worcester, Mass.

Filed Jan. 30, 1984, Ser. No. 575,108

Int. Cl.³ C04B 35/18, 35/48, 19/04

U.S. Cl. 501—17 **7 Claims**

1. A raw batch adapted to be mixed with water to form a mortar adapted to be dried and then fired in situ particularly for use with silicon carbide containing elements including silicon carbide shapes bonded with oxides, silicon nitride or silicon oxynitride comprising a mixture of from 70% to 90% by weight of a calcined refractory mullite grain containing 70% alumina, from 2% to 7% by weight of a ball clay, from 2% to 10% by weight of a finely ground chemically active alumina, from 1% to 4% by weight of a purified bentonite, from 0.5% to 1.5% by weight of sodium silicate, and from 5% to 15% by weight of a glass frit.

7. A raw batch adapted to be mixed with water to form a mortar adapted to be dried and then fired in situ particularly for use with silicon carbide containing elements including silicon carbide shapes bonded with oxides, silicon nitride or silicon oxynitride comprising a mixture of from 70% to 90% by weight of a calcined refractory zircon grain, from 2% to 7% by weight of a ball clay, from 2% to 10% by weight of a finely ground chemically active alumina, from 1% to 4% by weight of a purified bentonite, from 0.5 to 1.5% by weight of sodium silicate, and from 5% to 15% by weight of a glass frit.

4,533,645

HIGH THERMAL CONDUCTIVITY ALUMINUM NITRIDE CERAMIC BODY

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 519,158, Aug. 1, 1983, Pat. No. 4,478,785. This application Jul. 11, 1984, Ser. No. 629,666

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.³ C04B 35/58

U.S. Cl. 501—96 **16 Claims**

1. A polycrystalline aluminum nitride body having a density greater than 85% of the theoretical density for aluminum nitride and a thermal conductivity greater than 0.5 W/cm·K at 22° C., said body consisting essentially of aluminum nitride phase, said body containing oxygen in an amount ranging from greater than about 0.35% by weight up to about 1.1% by weight of said body as determined by neutron activation analysis, said body containing carbon in an amount ranging from a detectable amount to less than about 0.2% by weight of said body, said body being produced by the process which consists essentially of providing at least a substantially uniform particulate mixture comprised of aluminum nitride having a predetermined oxygen content greater than about 0.8% by weight of said particulate aluminum nitride and a carbonaceous additive selected from the group consisting of free carbon, carbonaceous organic material and mixtures thereof, said aluminum nitride having a specific surface area greater than about 4.7 m^2/g, said carbonaceous organic material pyrolyzing at a temperature ranging from about 50° C. to 1000° C. to free carbon and gaseous product of decomposition which vaporizes away, said free carbon having a specific surface area greater

than about 40 m^2/g, deoxidizing said particulate mixture by heating said mixture in a nonoxidizing atmosphere selected from the group consisting of argon, nitrogen and mixtures thereof to a temperature ranging from about 1350° C. to about 1750° C. pyrolyzing any organic material therein to produce free carbon and reacting the free carbon therein with the oxygen content of said aluminum nitride producing deoxidized powder and gaseous product which vaporizes away, said free carbon being in an amount which produces a deoxidized powder having an oxygen content ranging from greater than about 0.35% by weight to about 1.1% by weight of said deoxidized powder and which is at least about 20% by weight lower than said predetermined oxygen content, shaping the deoxidized powder into a compact and sintering the compact at ambient pressure in a nonoxidizing atmosphere selected from the group consisting of argon, nitrogen and mixtures thereof at a temperature ranging from about 1900° C. to about 2200° C. producing said sintered body, said compact retaining its oxygen content in an amount greater than about 0.35% by weight of said compact during said sintering, said oxygen content being determinable by neutron activation analysis.

4,533,646
NITRIDE BONDED OXIDE REFRACTORIES

Ke-Chin Wang, Pittsburgh, and Howard M. Winkelbauer, Mifflin, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 384,709, Jun. 3, 1982, abandoned. This application May 24, 1984, Ser. No. 613,941

Int. Cl.³ C04B *35/58, 35/18, 35/10*

U.S. Cl. 501—97 **2 Claims**

1. A nitride bonded refractory shape formed by an in situ reaction in a nitriding atmosphere consisting essentially of a size graded batch comprising 55 to 63 percent, by weight, −3 to +65 mesh Tyler coarse refractory aggregate, selected from the group consisting of calcined and fused aggregates of alumina, alumino-silicate, and magnesium aluminate spinel, and 37 to 45 percent, by weight, of a −65 mesh Tyler, fine portion consisting essentially of 3 to 20 percent, by weight, silicon metal, 0.75 to 20 percent, by weight, alumina, and the balance consisting of fines of the refractory aggregate, the weight ratio of said −65 mesh Tyler alumina to said −65 mesh Tyler silicon, equaling at least 1:4.

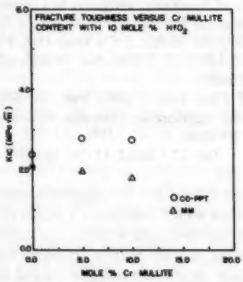
4,533,647
CERAMIC COMPOSITIONS

Tseng-Ying Tien, Ann Arbor, Mich., assignor to The Board of Regents acting for and on behalf of the University of Michigan, Ann Arbor, Mich.

Filed Oct. 27, 1983, Ser. No. 546,119

Int. Cl.³ C04B *35/10, 35/12, 35/48*

U.S. Cl. 501—105 **18 Claims**



1. A ceramic composition comprising:

(a) a matrix phase selected from the group consisting of solid solutions characterized by the formula $Al_2O_3.xCr_2O_3$ and the formula $3Al_2O_3.2SiO_2+x[3Cr_2O_3.2SiO_2]$ where x is the relative mole fraction of Cr_2O_3 or $3Cr_2O_3.2SiO_2$; and

(b) a dispersed phase characterized by the formula ZrO_2.$yHfO_2$ where y is the relative mole fraction of HfO_2.

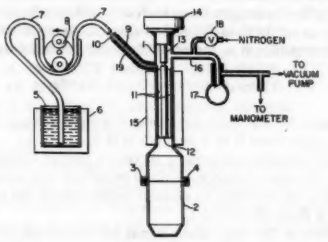
4,533,648
REGENERATION OF COPPER CHROMITE HYDROGENATION CATALYST

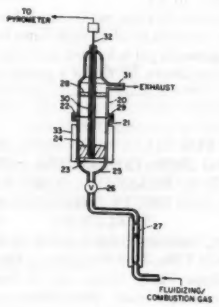
Patrick J. Corrigan, Fairfield; Richard M. King, and Scott A. VanDiest, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 23, 1984, Ser. No. 602,887

Int. Cl.³ B01J *23/94, 23/92;* **C07C** *34/20, 29/136*

U.S. Cl. 502—38 **14 Claims**





1. A process for regenerating spent copper chromite catalyst which has been used in the hydrogenation of carboxylic acids containing from about 6 to abut 30 carbon atoms or carboxylic acid esters containing from about 7 to about 31 carbon atoms to produce alcohols, the said spent catalyst comprising at least about 50% by weight organic residue from said hydrogenation process, the said regeneration process comprising the steps of:

(1) subjecting the spent catalyst to a vacuum of from about 1 mm to about 20 mm Hg at a temperature of from about 65° C. to about 320° C. for a time period of less than about one minute to reduce the organic residue content of the spent catalyst to less than about 20% by weight, thereby converting said spent catalyst to a free flowing granular form, and

(2) heating the vacuum-treated catalyst from Step (1) in an atmosphere comprising molecular oxygen while maintaining the temperature at about 260° C. to about 370° C., whereby any remaining organic residue is burned off and the catalyst is reoxidized.

2. The process of claim 1 wherein the temperature and vacuum pressure in Step (1) are selected such that the time period needed to reduce the organic residue content of the spent catalyst to less than about 25% is less than 30 seconds.

3. The process of claim 2, wherein during transfer of the catalyst from Step (1) to Step (2), the catalyst is kept out of

contact with air by blanketing the catalyst with an inert gas or by maintaining a vacuum over the catalyst.

4,533,649
METHOD OF PREPARING CRYSTALLINE ALUMINOSILICATES

William J. Ball, Capel; Sami A. I. Barri, London, and Dennis Young, Staines, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Sep. 1, 1983, Ser. No. 528,528

Claims priority, application United Kingdom, Sep. 7, 1982, 8225524

Int. Cl.³ C01B *33/28*; B01J *29/28*

U.S. Cl. 502—71 **8 Claims**

1. A process for producing crystalline aluminosilicates having in the hydrogen form an X-ray diffraction pattern substantially as set forth in Table 1 of this specification and the following composition in terms of the mole ratios of the oxides:

$$0.9\pm0.2M_{2/n}O:Al_2O_3:xSiO_2:yH_2O:zNH_3$$

wherein M is at least one cation having a valence n, x is at least 10, y/x is from 0 to 5 and z/x is 0–5,

said process comprising mixing a source silica, a source of alumina, a source of alkali metal (s), water and ammonia,

wherein the silica to alumina mole ratio in the initial mixture is from 45 to 150:1,.

wherein the free alkali metal (s) hydroxide to water mole ratio is from 2×10^{-3}:1 to 8×10^{-3}:1,

wherein the free alkalii metal (s) hydroxide to silica mole ratio is 0.01:1 to 1:1,

wherein the water to silica mole ratio is from 5:1 to 50:1, and

wherein the ammonia to silica mole ratio is from 0.5:1 to 4:1,

until a homogeneous gel is formed and crystallising the gel at a temperature above 70° C. for a period of at least 2 hours.

4,533,650
PROCESS FOR MANUFACTURING A CATALYST CONTAINING IRON, CHROMIUM AND POTASSIUM OXIDES AND AT LEAST ONE RARE EARTH METAL OXIDE, FOR USE IN DEHYDROGENATION REACTIONS

Philippe Courty, Houilles; Michel Roussel, Antony; Serge Leporq, Mantes la Ville; Jean-Francois Le Page, Rueil Malmaison, and Philippe Varin, Massy, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 14, 1983, Ser. No. 561,374

Claims priority, application France, Dec. 14, 1982, 82 21085; Dec. 14, 1982, 82 21086

Int. Cl.³ B01J *21/16, 23/10*

U.S. Cl. 502—84 **20 Claims**

1. A process for manufacturing a catalyst containing iron, chromium and potassium, as oxides, in the ratios by weight:

$$\frac{Fe_2O_3}{K_2O} \text{ from 1/1 to 10/1}$$

$$\frac{CrO_3}{K_2O} \text{ from 0.05/1 to 0.4/1}$$

$$\frac{Fe_2O_3}{CrO_3} \text{ from 15/1 to 40/1,}$$

and at least one rare earth metal, in a proportion, calculated as oxide, from 1 to 15% by weight with respect to the weight of said catalyst, said process being characterized in that it comprises:

a first step of manufacturing a product by reacting at least one rare earth (RE) metal compound with at least one compound of at least one metal (M) selected from iron, chromium, cobalt, aluminium and vanadium, said reaction being followed with heating at high temperature; and

a second step of forming a mixture comprising water, at least one iron compound, at least one chromium compound, at least one potassium compound and the product obtained at the end of the first step, the various metal compounds being used in proportions corresponding to the indicated oxide proportions by weight, malaxing said mixture to form a paste which is then dried and thermally activating the catalyst by heating at high temperature.

2. A process according to claim 1, characterized in that, in the catalyst, the ratios by weight between iron, chromium and potassium, calculated as oxides, are:

$$\frac{Fe_2O_3}{K_2O} \text{ from 2/1 to 7/1}$$

$$\frac{CrO_3}{K_2O} \text{ from 0.1/1 to 0.3/1; and}$$

$$\frac{Fe_2O_3}{CrO_3} \text{ from 25/1 to 35/1,}$$

and the proportion of rare earth metal, calculated as oxide, is from 3 to 10% by weight.

10. A process according to one of claims 1 or 2, characterized in that, during the second step, a clayish material is used in a proportion from 3.5 to 30% by weight with respect to the totality of the mixture components, calculated as oxides, the potassium compound being used in excess with respect to the amount liable to combine with said clayish material to form a double aluminium and potassium silicate, the excess of said potassium compound being, in proportion to iron and chromium, calculated as oxides, in the following ratios by weight:

$$\frac{Fe_2O_3}{K_2O \text{ excess}} \text{ : from 3/1 to 10/1; and}$$

$$\frac{CrO_3}{K_2O \text{ excess}} \text{ : from 0.1/1 to 0.4/1}$$

4,533,651
CATALYSTS FOR OLEFIN OLIGOMERIZATION AND ISOMERIZATION

Anthony F. Masters, Diamond Creek, and Kingsley J. Cavell, Balwyn, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU83/00013, § 371 Date Oct. 17, 1983, § 102(e) Date Oct. 17, 1983, PCT Pub. No. WO83/02907, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 2, 1983, Ser. No. 548,887

Claims priority, application Australia, Feb. 17, 1982, PF2750; Jun. 25, 1982, PF4596

Int. Cl.³ B01J *31/14, 31/22*

U.S. Cl. 502—117 **11 Claims**

1. In a catalyst system for the oligomerization and/or isomerization of olefins which comprises a nickel (II) complex and co-catalyst, the improvement wherein the nickel (II) complex is a square planar species with a trivalent Group V donor ligand, a halogen or pseudo-halogen ligand and a dithio-β-diketone ligand which may be substituted with one or more non-deleterious groups.

9. The catalyst system of claim 1 or claim 3, characterized in that the cocatalyst is an aluminium alkyl chloride.

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AZO POLYMERIZATION INITIATOR COMPOSITION

Motoaki Tanaka, Urawa; Takanori Toyama, Kawagoe; Hitoshi Oba, Saitama, and Osamu Yamaguchi, Sayama, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 9, 1984, Ser. No. 597,893
Claims priority, application Japan, Jul. 7, 1983, 58-123861
The portion of the term of this patent subsequent to Feb. 19, 2002, has been disclaimed.
Int. Cl.³ C08F 2/18, 4/04, 2/20, 14.06
U.S. Cl. 502—167 11 Claims

1. An azo polymerization initiator composition comprising an azo polymerization initiator compound, a dispersing agent in an amount of 0.001 to 30% by weight based on the weight of the azo polymerization initiator compound, and a surface active agent in an amount of 0.5% to 30% by weight based on the weight of the azo polymerization initiator compound, wherein said dispersing agent is selected from the group consisting of a synthetic high polymer, a cellulose derivative, an animal protein, a vegetable mucilage, a material derived from seaweeds, starch or fabricated starch, and said surface active agent is selected from the group consisting of cationic, anionic, and non-ionic surface active agents, said composition having a water content of 0to 50% by weight.

8. An azo polymerization initiator composition obtained by kneading an azo polymerization initiator compound, a dispersing agent in an amount of 0.001 to 30% by weight based on the weight of the azo polymerization initiator compound, and a surface active agent in an amount of 0.5 to 30% by weight based on the weight of the azo polymerization initiator compound at a temperature of 20° C. or lower, while adjusting the water content of the composition to 0 to 50% by weight, wherein said dispersing agent is selected from the group consisting of a synthetic high polymer, a cellulose derivative, an animal protein, a vegetable mucilage, a material derived from seaweeds, starch or fabricated starch, and said surface active agent is selected from the group consisting of cationic, anionic, and non-ionic surface active agents.

9. A process for producing an azo polymerziation initiator composition which comprises kneading an azo polymerization initiator compound, a dispersing agent in an amount of 0.001 to 30% by weight based on the weight of the azo polymerization initiator compound, and a surface active agent in an amount of 0.5 to 30% by weight based on the weight of the azo polymerization initiator compound at a temperature of 20° C. or lower, while adjusting the water content of the composition to 0 to 50% by weight, wherein said dispersing agent is selected from the group consisting of a synthetic high polymer, a cellulose derivative, an animal protein, a vegetable mucilage, a material derived from seaweeds, starch or fabricated starch, and said surface active agent is selected from the group consisting of cationic, anionic, and non-ionic surface active agents.

4,533,653

PREPARATION OF AN IMPROVED CATALYST FOR THE MANUFACTURE OF NAPHTHOQUINONE

Nobuyuki Ishibe; Renard L. Thomas, both of Lake Jackson, and Emmett L. Tasset, Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 20, 1982, Ser. No. 451,123
Int. Cl.³ B01J 21/08, 23/20
U.S. Cl. 502—242 6 Claims

1. In the process of making an oxidation catalyst containing vanadium, tin and potassium with a silicate binder the improvement which comprises employing an organic porosity control agent consisting of naphthalene, anthracene or a mixture thereof during the catalyst preparation to produce a catalyst having a mean pore diameter of from about 5 to about 15 microns and wherein at least 90% of the pores have diameters of less than about 10 microns.

2. A process of making a catalyst for the vapor phase oxidation of naphthalene or anthracene to produce naphthoquinone and anthraquinone, respectively, which comprises (1) combining ammonium vanadate, potassium sulfate, ammonium sulfate, tin oxide, silicic acid and an organic porosity control agent consisting of naphthalene, anthracene or a mixture thereof, (2) thoroughly grinding and mixing these components, (3) compressing said mixture into tablets and (4) calcining said tablets at a temperature of from about 400° to about 600° C., whereby a catalyst is produced having a mean pore diameter of from about 5 to about 15 microns and wherein at least 90% of the pores have diameters of less than about 10 microns.

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UROTENSIN PEPTIDES

Karl P. Lederis; Keith L. MacCannell, both of Calgary, Canada, and Tomoyuki Ichikawa, Tokyo, Japan, assignors to The Salk Institute For Biological Studies, San Diego, Calif.

PCT No. PCT/US82/01349, § 371 Date Apr. 3, 1984, § 102(e) Date Apr. 6, 1984, PCT Pub. No. WO84/01378, PCT Pub. Date Apr. 12, 1984
PCT Filed Sep. 29, 1982, Ser. No. 600,554
Int. Cl.³ A61K 37/00; C07C 103/52
U.S. Cl. 514—12 9 Claims

1. A synthetic polypeptide having the formula: H-Asn-Asp-Asp-Pro-Pro-Ile-Ser-Ile-Asp-Leu-Thr-Phe-His-Leu-Leu-Arg-Asn-Met-Ile-Glu-Met-Ala-Arg-Asn-Glu-Asn-Gln-Arg-Glu-Gln-Ala-Gly-Leu-Asn-Arg-Lys-Tyr-Leu-Asp-Glu-Val-NH_2 or a biologically active peptide fragment thereof containing at least the residues in positions 4 through 28; or a nontoxic addition salt of either.

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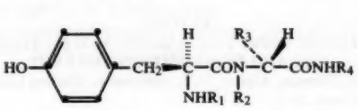
ANALGESIC DIPEPTIDE AMIDES AND METHOD OF USE AND COMPOSITIONS THEREOF

Barry A. Morgan, Albany, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 286,672, Jul. 24, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,138
Int. Cl.³ A61K 37/00; C07C 103/52
U.S. Cl. 514—18 18 Claims

1. 2-(L-N^2-R_1N-R_2-tyrosylamino)-2-R_3N-R_4-acetamide having the structural formula



wherein

R_1 is hydrogen or methyl; and

R_2 is hydrogen or methyl; provided that at least one of R_1 and R_2 is other than hydrogen;

R_3 is alkyl of one to five carbon atoms; and

R_4 is $(CH_2)_nY$, wherein n is an integer from 2 through 10 and Y is phenyl or phenyl substituted by fluoro;

or a pharmaceutically acceptable acid addition salt thereof.

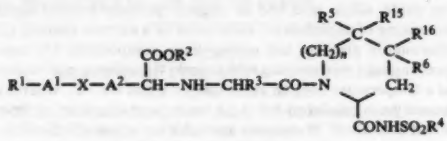
4,533,656

AMIDE DERIVATIVES

Edward R. H. Walker, Wilmslow, United Kingdom, assignor to Imperial Chemical Industries PLC, London, England

Filed Jul. 13, 1983, Ser. No. 513,290
Claims priority, application United Kingdom, Jul. 19, 1982, 8220879
Int. Cl.³ A61K 37/00; A01N 57/00, 43/42, 43/36; C07D 215/00, 401/00, 211/06
U.S. Cl. 514—19 7 Claims

1. An amide derivative of the formula:



wherein either R^1 is aryl or heterocyclic and A^1 is a direct link, or R^1 is aryl or heterocyclic, or hydrogen or amino and A_1 is alkylene of 1 to 5 carbon atoms; wherein X is —CO— or has the formula

wherein R^{11} and R^{12}, which may be the same or different, each is alkyl of up to 5 carbon atoms, or R^{11} and R^{12} are joined to form alkylene of 2 to 5 carbon atoms; wherein A^2 is alkylene of 2 to 4 carbon atoms; wherein R^2 is hydrogen, aryl or alkyl of up to 5 carbon atoms which is unsubstituted or which bears an aryl substituent; wherein R^3 is hydrogen or alkyl of up to 5 carbon atoms which is unsubstituted or which bears a halogeno, hydroxy, amino, guanidino, carboxy, carbamoyl or mercapto substituent, or an alkoxy, alkylamino, dialkylamino, cyclic amino or alkylthio substituent wherein each alkyl is of up to 5 carbon atoms and wherein cyclic amino has up to 6 carbon atoms, or an alkanoylamino or alkoxycarbonyl substituent each of up to 6 carbon atoms or an arylalkoxycarbonyl substituent of up to 10 carbon atoms, or an aryl or heterocyclyl substituent; wherein R^4 is alkyl of up to 5 carbon atoms which is unsubstituted or which bears an aryl substituent, or R^4 is phenyl or alkylphenyl; wherein n is 0 or 1; and wherein either R^5, R^6, R^{15} and R^{16} are all hydrogen, or R^5 and R^6 are both hydrogen and R^{15} and R^{16} together form tetramethylene [—$(CH_2)_4$—]; or R^5 and R^6 together form a second bond between the two carbon atoms to which they are attached and R^{15} and R^{16} together form buta-1,3-dien-1,4-diyl such that together with the CR^5–CR^6 group they form a fused benzo-ring; or a salt thereof where appropriate.

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ANALGESIC DIPEPTIDE AMIDES AND METHOD OF USE AND COMPOSITION THEREOF

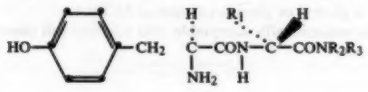
Barry A. Morgan, Albany, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 286,672, Jul. 24, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,139

Int. Cl.[3] **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 514—19 **14 Claims**

1. 2-(L-tyrosylamino)-2-R_1-N-R_2-N-R_3-acetamide having the structural formula



wherein

R_1 is alkyl of one to five carbon atoms;

R_2 is $CHQ(CH_2)_nY$ wherein n is an integer from 1 through 9, Q is hydrogen or methyl, and Y is phenyl or phenyl substituted by fluoro, chloro, methyl, methoxy or trifluoromethyl; and

R_3 is selected from the group consisting of $CHQ(CH_2)_nY$ as defined for R_2 and $(CH_2)_mX$ wherein m is an integer from 1 through 4 and X is amino, methylamino, dimethylamino, dimethyloxoamino, acetamido, N-methylacetamido, methylthio, methylsulfinyl, methylsulfonyl, hydroxy, carboxy, carbamoyl, methylcarbamoyl or dimethylcarbamoyl;

or a pharmaceutically acceptable acid addition salt thereof.

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INSECTICIDAL 3-ALKYL-5-(ALKOXY- OR ALKYLTHIO-PHOSPHYNYL OR PHOSPHINOTHIOYL-THIOMETHYL)-1,2,4-OXADIAZOLES

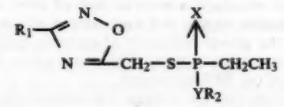
William F. King, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 322,995, Nov. 19, 1981, abandoned. This application Apr. 19, 1984, Ser. No. 601,889

Int. Cl.[3] **A01N** *57/24;* **C07F** *9/65*

U.S. Cl. 514—92 **15 Claims**

1. A compound of the formula:



(I)

wherein X is sulfur or oxygen, Y is sulfur or oxygen, R_1 is methyl, ethyl, isopropyl or cyclopropyl, R_2 is ethyl or isopropyl provided that when R_1 is methyl or ethyl, then R_2 is not ethyl.

2. A compound according to claim 1 wherein Y is sulfur.

7. A method of controlling corn root worms which comprises applying to the soil habitat of the corn root worms an insecticidally effective amount of a compound of claim 2.

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MICROBICIDAL 2-(1H-1,2,4-TRIAZOLYLMETHYL-1'-YL)-2-SILOXY-2-PHENYL-ACETATES

Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Walter Kunz, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

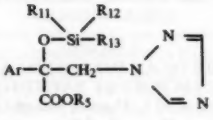
Filed May 31, 1983, Ser. No. 499,725

Claims priority, application Switzerland, Sep. 6, 1982, 3558/82

Int. Cl.[3] **A61K** *31/555;* **C07D** *207/30*

U.S. Cl. 514—184 **8 Claims**

1. A compound of the formula



wherein

Ar is phenyl substituted in the ortho- and/or para-position by nitro, fluorine, chlorine, bromine, methyl, methoxy or trifluoromethyl,

R_5 is C_1–C_4 alkyl, phenyl, benzyl, or phenyl or benzyl substituted by nitro, chlorine, bromine, fluorine or methyl, and

each of R_{11}, R_{12} and R_{13} is C_1–C_4 or phenyl, each optionally substituted by halogen,

or an acid addition salt or metal complex thereof.

8. A method of controlling phytopathogenic microorganisms or of protecting cultivated plants from attack by such microorganisms, which comprises applying to said plants or to the locus thereof a microbicidally effective amount of a compound as claimed in claim 1.

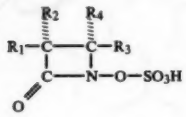
4,533,660

ANTIBACTERIAL O-SULFATED β-LACTAM HYDROXAMIC ACIDS

Eric M. Gordon, Pennington, and Miguel A. Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

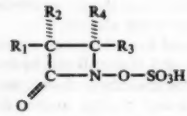
Division of Ser. No. 202,830, Oct. 31, 1980, Pat. No. 4,337,197.
This application Nov. 12, 1981, Ser. No. 320,407
Int. Cl.³ C07D *205/08;* **A61K** *31/395, 403/12, 401/12*
U.S. Cl. 514—210 **25 Claims**

1. A pharmaceutically acceptable salt, including inner salt, of a β-lactam having the formula



wherein R_1 is an acyl group derived from a carboxylic acid; R_2 is hydrogen or alkoxy of 1 to 4 carbon atoms; and R_3 and R_4 are the same or different and each is hydrogen or alkyl of 1 to 10 carbon atoms.

6. A method of treating bacterial infections in mammals which comprises administering to a mammal in need thereof an effective amount of a pharmaceutically acceptable salt, including inner salt, of a β-lactam having the formula



wherein R_1 is an acyl group derived from a carboxylic acid; R_2 is hydrogen or alkoxy of 1 to 4 carbon atoms; and R_3 and R_4 are the same or different and each is hydrogen or alkyl of 1 to 10 carbon atoms.

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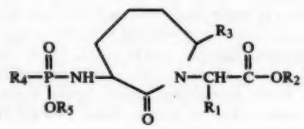
CERTAIN 3-PHOSPHINYL-AMINO-2-OXO-1H-AZEPINE-1-ACETIC ACID DERIVATIVES HAVING ANTI-HYPERTENSIVE ACTIVITY

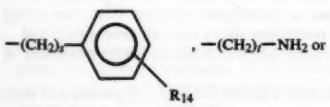
Donald S. Karanewsky, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 28, 1983, Ser. No. 479,429
Int. Cl.³ C07F *9/65, 9/58*
U.S. Cl. 514—212 **6 Claims**

1. A compound of the formula



or pharmaceutically acceptable salt thereof wherein:
R_4 is alkyl of 1 to 10 carbons,



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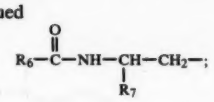
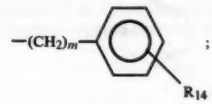
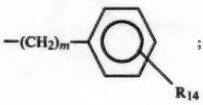


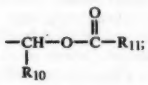
R_6 and R_7 are independently selected from the group consisting of lower alkyl of 1 to 4 carbons and



s is zero or an integer from 1 to 7;
t is an integer from 1 to 8;
m is zero, one, two or three;
R_{14} is hydrogen, methyl, methoxy, methylthio, chloro, bromo, fluoro, or hydroxy;
R_1 is hydrogen, lower alkyl of 1 to 4 carbons, or $-(CH_2)_4-NH_2$;
R_3 is hydrogen, lower alkyl of 1 to 4 carbons or



R_5 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbons, alkali metal salt ion, and



R_{10} is hydrogen, straight or branched chain lower alkyl of 1 to 4 carbons, or cyclohexyl; and
R_{11} is straight or branched chain lower alkyl of 1 to 4 carbons, cyclohexyl or phenyl.

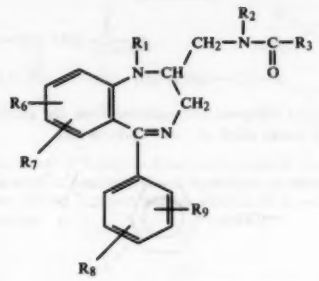
4,533,662

2-ACYLAMINOMETHYL-1,4-BENZODIAZEPINE COMPOUNDS AND ANALGESIC USE

Horst Zeugner, Hanover, Fed. Rep. of Germany; Dietmar Roemer, Allschwil, Switzerland; Hans Liepmann, Hanover, and Wolfgang Milkowski, Burgdorf, both of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,324
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048264
The portion of the term of this patent subsequent to Apr. 20, 1999, has been disclaimed.
Int. Cl.³ A61K *31/55;* **C07D** *243/16, 405/10*
U.S. Cl. 514—221 **28 Claims**

1. A 2-phenyl acyl amino methyl-1H-2,3-dihydro-1,4-benzo diazepine compound of the following Formula I

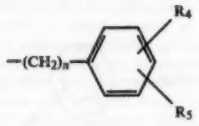


in which

R_1 indicates a substituent selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, and cyclopropyl methyl;

R_2 indicates a substituent selected from the group consisting of hydrogen, lower alkyl, and lower alkenyl;

R_3 indicates the group of the following Formula



in which

R_4 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, lower alkylthio, nitro, trifluoromethyl, cyano, amino, lower mono-alkyl amino, lower di-alkyl amino, lower mono-alkanoyl amino, lower N-alkyl-N-alkanoyl amino, and lower alkanoyloxy; and

R_5 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, and lower alkanoyloxy; with the proviso that one of R_4 and R_5 indicates a substituent selected from the group consisting of halogen, lower alkyl, nitro and trifluoromethyl;

n indicates a numeral selected from the group consisting of the numerals 0, 1, and 2;

R_6 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, lower alkylthio, nitro, trifluoromethyl, cyano, amino, lower mono-alkyl amino, lower di-alkyl amino, lower mono-alkanoyl amino, lower N-alkyl-N-alkanoyl amino, and lower alkanoyloxy; and

R_7 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, and lower alkanoyloxy; or

R_6 and R_7, when attached to adjacent carbon atoms, together indicate a substituent selected from the group consisting of methylene di-oxy and ethylene di-oxy;

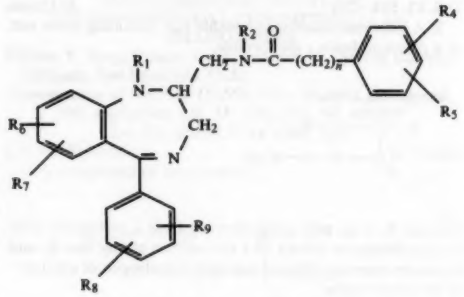
R_8 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, lower alkylthio, nitro, trifluoromethyl, cyano, amino, lower mono-alkyl amino, lower di-alkyl amino, lower mono-alkanoyl amino, lower N-alkyl-N-alkanoyl amino, and lower alkanoyloxy; and

R_9 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, and lower alkanoyloxy; or

R_8 and R_9, when attached to adjacent carbon atoms, together indicate a substituent selected from the group consisting of methylene di-oxy and ethylene di-oxy;

and the optically active isomers of said compounds and their acid addition salts.

27. In a method of alleviating pain in a mammal, the step of administering to said mammal an effective pain alleviating dose of a 2-phenylacylaminomethyl-1H-2,3-dihydro-1,4-benzodiazepine compound corresponding to the formula:



wherein:

R_1 indicates a substituent selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and cyclopropyl methyl;

R_2 indicates a substituent selected from the group consisting of hydrogen, lower alkyl and lower alkenyl;

R_4 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alyl, lower alkoxy, hydroxyl, lower alkylthio, nitro, trifluoromethyl, cyano, amino, lower mono-alkyl amino, lower di-alkyl amino, lower mono-alkanoyl amino, lower N-alkyl-N-alkanoyl amino and lower alkanoyloxy;

R_5 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl and lower alkanoyloxy; or

R_4 and R_5 are attached to adjacent carbon atoms and together indicate a substituent selected from the group consisting of methylene dioxy and ethylene dioxy;

R_6 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, lower alkylthio, nitro, trifluoromethyl, cyano, amino, lower mono-alkyl amino, lower di-alkyl amino, lower mono-alkanoyl amino, lower N-alkyl-N-alkanoyl amino and lower alkanoyloxy;

R_7 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl and lower alkanoyloxy; or

R_6 and R_7 are attached to adjacent carbon atoms and together indicate a substituent selected from the group consisting of methylene dioxy and ethylene dioxy;

R_8 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, lower alkylthio, nitro, trifluoromethyl, cyano, amino, lower mono-alkyl amino, lower di-alkyl amino, lower mono-alkanoyl amino, lower N-alkyl-N-alkanoyl amino and lower alkanoyloxy;

R_9 indicates a substituent selected from the group consisting of hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl and lower alkanoyloxy; or

R_8 and R_9 are attached to adjacent carbon atoms and together indicate a substituent selected from the group consisting of methylene dioxy and ethylene dioxy; and

n indicates a numeral selected from the group consisting of 0, 1 and 2;

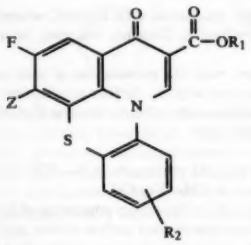
and the optically active isomers of said compounds and their acid addition salts.

4,533,663
QUINO-BENZOTHIAZINE ANTIBACTERIAL COMPOUNDS

Daniel T. Chu, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 26, 1984, Ser. No. 604,338
Int. Cl.[3] C07D *279/14, 513/14;* A61K *31/54*
U.S. Cl. 514—223 17 Claims

1. A compound having the formula

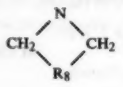


wherein R_1 is hydrogen or a carboxy protecting group; R_2 is one or more groups selected from the group consisting of hydrogen, halogen, nitro, carboxyl, methylenedioxy, cyano, C_1 to C_6 alkyl halo-substituted C_1 to C_6 alkyl, hydroxy-substituted C_1 to C_6 alkyl, a group having the formula:

$$-Y-R_3$$

wherein —Y— is —O— or —S— and R_3 is hydrogen or C_1 to C_6 alkyl, and an amine group having the formula:

wherein R_4 and R_5 are independently hydrogen or C_1 to C_6 alkyl; and Z is selected from the group consisting of an aliphatic heterocyclic ring having the structure



wherein R_8 is methylene, dimethylene or a group of the formula $—CH_2—CH_2—R_9—CH_2$ or $—CH_2—R_9—CH_2—$ wherein R_9 is selected from the group consisting of —S—, —O— and —N—; substituted derivatives thereof having one or more substitutents selected from the group consisting of C_1 to C_6 alkyl, C_1 to C_6 hydroxyalkyl, hydroxy, alkanoyl contaning 1 to 6 carbon atoms, alkanoylamido containing 1 to 6 carbon atoms and an amine of the formula

wherein R_{10} and R_{11} are each independently selected from the group consisting of hydrogen, C_1 to C_6 alkyl, halo-substituted C_1 to C_6 alkyl and hydroxy-substituted C_1 to C_6 alkyl; and an amino group of the formula

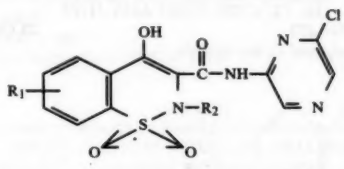
wherein R_6 is hydrogen or C_1 to C_{10} alkyl, halo-substituted C_1 to C_{10} alkyl or hydroxy-substituted C_1 to C_{10} alkyl; and R_7 is selected from the group consisting of C_1 to C_{10} alkyl, halo-substituted C_1 to C_{10}alkyl, hydroxy-substituted C_1 to C_{10} alkyl, an amine group, a mono-(C_1 to C_6)alkylamino group and a di-(C_1 to C_6)alkylamino group, and pharmaceutically acceptable salts thereof.

4,533,664
ANTITHROMBOTIC N-(6-CHLORO-PYRAZIN-2-YL)-4-HYDROXY-2H-1,2-BENZOTHIAZINE-3-CARBOXAMIDE-1,1-DIOXIDE DERIVATIVES, COMPOSITION, AND METHOD OF USE

Günter Trummlitz, Warthausen; Wolfhard Engel, Biberach; Ernst Seeger, Biberach, and Walter Haarmann, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach/Riss, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,592
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237473
Int. Cl.[3] A61K *31/38;* C07D *417/02*
U.S. Cl. 514—225 5 Claims

1. A compound of the formula



wherein

R_1 is hydrogen, methyl, methoxy, fluorine or chlorine; and

R_2 is hydrogen, methyl, ethyl or n-propyl;

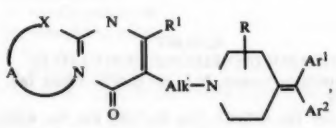
or a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

4,533,665
[[BIS(ARYL)METHYLENE]-1-PIPERIDINYL]ALKYL-PYRIMIDINONES

Ludo E. J. Kennis, Turnhout; Jan Vandenberk, Beerse, and Josephus C. Mertens, Oud-Turnhout, all of Belgium, assignors to Janssen Pharmaceutica, Beerse, Belgium

Division of Ser. No. 517,612, Jul. 27, 1983, Pat. No. 4,485,107, which is a continuation-in-part of Ser. No. 438,079, Nov. 1, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 655,136
Int. Cl.[3] C07D *513/04;* A61K *31/505*
U.S. Cl. 514—258 9 Claims

1. A chemical compound having the formula



(I)

the possible stereochemically isomeric forms and the pharmaceutically acceptable acid-addition salts thereof,

wherein:

R is hydrogen, hydroxy or lower alkyloxy;

R^1 is a member selected from the group consisting of hydrogen and lower alkyl;
Alk is a lower alkanediyl radical;
X is a member selected from the group consisting of —S—;
A is a bivalent radical having the formula $—CH_2—CH_2—$, $—CH_2—CH_2—CH_2—$ or

wherein R^4 and R^5 are each independently selected from the group consisting of hydrogen, halo, amino and lower alkyl; and
Ar^1 and A^2 are each independently selected from the group consisting of pyridinyl, thienyl and phenyl, being optionally substituted with halo, hydroxy, lower alkyloxy, lower alkyl and trifluoromethyl.

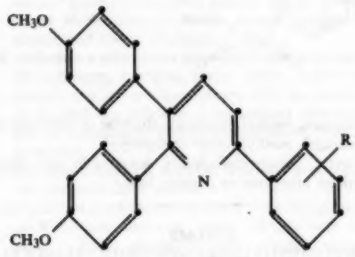
4,533,666

6-PHENYL-2,3-BIS-(4-METHOXYPHENYL)-PYRIDINE DERIVATIVES HAVING ANTI-INFLAMMATORY ACTIVITY

Ken Matsumoto, and John S. Ward, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 22, 1983, Ser. No. 506,933
Int. Cl.³ C07D *213/30*; A61K *31/44*
U.S. Cl. 514—277 **21 Claims**

1. A compound of the formula



I

and pharmaceutically acceptable salts thereof, wherein R is hydrogen, trifluoromethyl, fluoro, chloro, bromo, or iodo.

7. A method of treating inflammation which comprises administering to a mammal in need of such treatment an effective amount of a compound of claim 1.

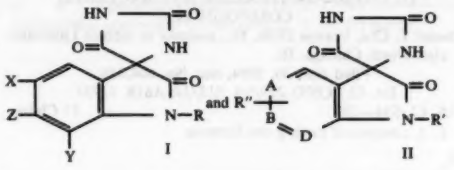
4,533,667

IMIDAZOLIDINEDIONE DERIVATIVES

Alan J. Hutchison, Verona, N.J., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 497,962, May 25, 1983, Pat. No. 4,464,380. This application Apr. 16, 1984, Ser. No. 600,759
Int. Cl.³ A61K *31/41*; C07D *471/20, 487/10*
U.S. Cl. 514—278 **19 Claims**

1. A compound selected from the group consisting of spirohydantoin derivatives of the formulae:



I II

and the pharmaceutically acceptable salts thereof, wherein
X and Y are each hydrogen, fluorine, chlorine, bromine, nitro or amino;
Z is hydrogen or amino, with the proviso that at least one of X, Y and Z is amino and with the further proviso that said Z is always other than amino when at least one of X and Y is other than hydrogen;
R is hydrogen;
=A—B=D— of formula II represents =N—CH=CH—, =CH—CH=N— or =CH—N=CH—;
R′ is a member selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, aryl and aralkyl having up to three carbon atoms in the alkyl moiety wherein each of said aryl moieties is chosen from the group consisting of pyridyl, thienyl, phenyl and mono and di-substituted phenyl, with each ring substituent being chosen from the group consisting of fluorine, chlorine, bromine, alkyl and alkoxy each having up to four carbon atoms and trifluoromethyl; and
R″ is hydrogen, hydroxy, fluorine, chlorine, alkyl or alkoxy each having up to four carbon atoms or trifluoromethyl.

19. A method for treating a diabetic host to prevent or alleviate chronic complications arising in said host, which comprises administering to said diabetic host an effective amount of a compound as claimed in claim 1.

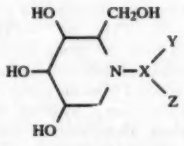
4,533,668

ANTIHYPERGLYCEMIC MORANOLINE DERIVATIVES

Shingo Matsumura, Kyoto; Hiroshi Enomoto, Nagaokakyo; Yoshiaki Aoyagi, Kyoto; Yoshiaki Yoshikuni, Kyoto; Kohei Kura, Ohmihachiman; Masahiro Yagi, Kusatsu, and Ichiro Shirahase, Kyoto, all of Japan, assignors to Nippon Shinyaku Co. Ltd., Japan

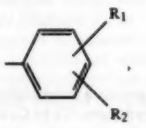
Filed Apr. 27, 1979, Ser. No. 33,839
Claims priority, application Japan, May 3, 1978, 53-53603; Jul. 6, 1978, 53-82606; Sep. 29, 1978, 53-120661; Jan. 20, 1979, 54-5714
Int. Cl.³ A61K *31/445*; C07D *211/46*
U.S. Cl. 514—321 **41 Claims**

1. An N-substituted moranoline of the formula

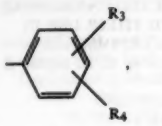


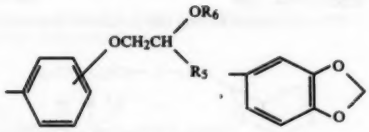
(I)

wherein X is divalent alkyl or alkenyl of 3 to 6 carbon atoms, Y is hydrogen, methyl or



and Z is





or thienyl, wherein R_1, R_2, R_3 and R_4 are independently hydrogen, halogen, lower alkyl, lower alkoxy, hydroxyl, trihalomethyl, phenoxy, diloweralkylamino, cyano, carboxyl, carbamoyl or carboloweralkoxy, R_5 is hydrogen or hydroxymethyl and R_6 is hydrogen, methyl, ethyl or methoxyethyl, or a pharmaceutically acceptable nontoxic acid addition salt thereof.

40. A method for the prophylaxis or treatment of hyperglycemic symptoms, which comprises administering to a human or animal in need thereof an amount of a compound of claim 1 effective to inhibit the increase of blood sugar.

4,533,669

ANTI-DEPRESSANT IMIDAZOLES

Motosuke Yamanaka, Abiko; Isao Saito, Chofu; Kiyomi Yamatsu, Kamakura, and Takako Fujimoto, Yokohama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

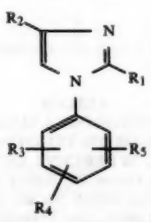
Division of Ser. No. 252,674, Apr. 9, 1981, Pat. No. 4,402,966, which is a division of Ser. No. 93,469, Nov. 13, 1979, Pat. No. 4,301,169. This application Feb. 25, 1983, Ser. No. 469,548

Claims priority, application Japan, Nov. 14, 1978, 53-139325; Nov. 21, 1978, 53-142813

Int. Cl.³ A61K *31/415;* **C07D** *233/61, 233/56*

U.S. Cl. 514—396 **19 Claims**

16. A method of treating depression and depressive states, which comprises administering to a subject a therapeutically effective amount of a pharmaceutical composition which comprises an imidazole compound of the formula:



wherein R_1 represents a lower alkyl group, R_2 represents a hydrogen atom or a lower alkyl group, and R_3, R_4 and R_5 may be the same or different and independently represent a hydrogen atom, a lower alkyl group, a trifluoromethyl group, an amino group, a mono- or di-lower alkylamino group, or a halogen atom, with the proviso that at least one of R_3, R_4 and R_5 is a trifluoromethyl group, an amino group, a mono- or di-lower alkylamino group, or a halogen atom; or a pharmaceutically acceptable acid addition salt thereof, in combination with a pharmaceutical carrier.

4,533,670

ANTI-CONVULSANT FLUORENYLALKYLIMIDAZOLE DERIVATIVES, COMPOSITIONS, AND METHOD OF USE

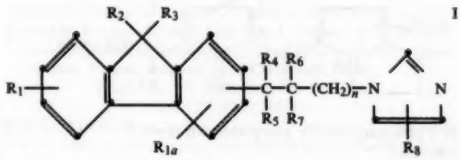
David W. Robertson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 21, 1983, Ser. No. 534,469

Int. Cl.³ A01N *43/50;* **A61K** *31/415;* **C07D** *233/60*

U.S. Cl. 514—399 **20 Claims**

1. A compound of the Formula



I

or a pharmaceutically acceptable salt thereof, wherein:

each of R_1 and R_{1a} is independently hydrogen, methyl, or halo;

each of R_2 and R_3 is independently hydrogen or methyl;

one of R_4 and R_5 is hydrogen or C_1–C_3 alkyl and the other of R_4 and R_5 is —G—R, or when taken together R_4 and R_5 are —G—CH_2—CR_aR_b—$(CH_2)_p$—G—, where G is —O— or —S—, R is hydrogen, C_1–C_3 alkyl, or R_9—CO—, R_9 is phenyl, C_1–C_3 alkyl, or C_3–C_7 cycloalkyl, each of R_a and R_b is independently hydrogen or methyl, and p is 0 or 1;

each of R_6 and R_7 is independently hydrogen, methyl, or ethyl;

n is 0–2; and

R_8 is hydrogen, methyl, or ethyl.

4,533,671

5-(2,3-DIHYDRO-1H-PYRROLIZIN-5-OYL)-2-ALKANOIC OR CARBOXYLIC ACIDS AND ANALOGS AS ANTI-INFLAMMATORY AND ANALGESIC AGENTS

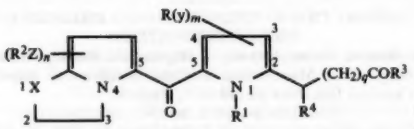
Tesfaye Biftu; Bruce E. Witzel, and Peter L. Barker, all of Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 8, 1982, Ser. No. 433,603

Int. Cl.³ C07D *207/26;* **A61K** *31/40*

U.S. Cl. 514—413 **7 Claims**

1. A compound of formula



or a pharmaceutically acceptable salt thereof wherein:

R is

(a) H or C_{1-6} alkyl;

(b) C_{2-4} alkenyl;

(c) haloC_{1-6} alkyl; or

(d) phenyl-C_{1-3} alkyl;

m is 0 or 1;

R^1 is H or C_{1-6} alkyl;

R^2Z is R^2 Z can be at any available positions and R^2 is R

q is 0;

n is 0 or 1;

R^3 is hydroxy, C_{1-6} alkoxy or C_{1-6} (alkanoylaminoalkoxy);

X is —CHR^5—;

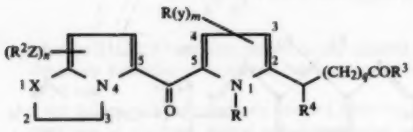
Y is —O—, —S—, CH_2— or H with the proviso that when Y is H, R is absent;

Z is —S—, —CH_2— or halo with the proviso that when Z is halo, R^2 is absent;

R^4 is hydrogen or C_{1-6}alkyl; and

R^5 is methyl or hydrogen.

6. A method of treating inflammatory conditions which comprises the administration to a mammalian species in need of such treatment an effective amount of a compound of formula



(I)

or a pharmaceutically acceptable salt thereof

wherein:

R is

(a) H or C_{1-6} alkyl;

(b) C_{2-4} alkenyl;

(c) haloC_{1-6} alkyl; or

(d) phenyl-C_{1-3} alkyl;

m is 0 or 1;

R^1 is H or C_{1-6} alkyl;

R^2Z is R^2 can be at any available positions and R^2 is R

q is 0;

n is 0 or 1;

R^3 is hydroxy,C_{1-6} alkoxy or C_{1-6} (alkanoylaminoalkoxy);

X is —CHR^5—;

Y is —O—, —S—, CH_2— or H with the proviso that when Y is H, R is absent;

Z is —S—, —CH_2— or halo with the proviso that when Z is halo, R^2 is absent;

R^4 is hydrogen or C_{1-6}alkyl; and

R^5 is methyl or hydrogen.

4,533,672

AMINO, CYANO PHENYLTHIO OR PHENOXYL INDOLE DERIVATIVES

Murdoch A. Eakin; Anthony J. Hayter, and Barrington J. A. Furr, all of Macclesfield, England, assignors to Imperial Chemical Industries plc, London, England

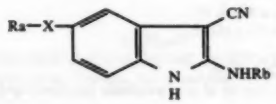
Filed Oct. 24, 1983, Ser. No. 545,010

Claims priority, application United Kingdom, Oct. 28, 1982, 8230765

Int. Cl.³ C07D *209/42*

U.S. Cl. 514—415 **6 Claims**

1. An indole of the formula I:



I

in which X is an oxygen or sulphur atom, Ra is a phenyl radical which is optionally substituted by one or two groups selected from halogen atoms and 1–6C alkyl, 1–6C alkoxy and trifluoromethyl radicals and Rb is a hydrogen atom or a 2–6C alkoxycarbonyl radical.

4,533,673

7-OXABICYCLOHEPTANE SUBSTITUTED ENAMINONE PROSTAGLANDIN ANALOGS AND THEIR USE IN TREATMENT OF THROMBOLYTIC DISEASE

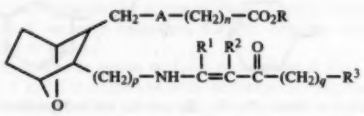
Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 26, 1984, Ser. No. 573,909

Int. Cl.³ C07D *307/935;* **A61K** *31/557*

U.S. Cl. 514—469 **15 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof;

wherein A is CH=CH or $(CH_2)_2$;

n is 1 to 8; R is H, lower alkyl or alkali metal; p is 1 to 5; q is 0 to 5; R^1 and R^2 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl and aralkyl, and R^3 is lower alkyl, aryl, aralkyl or cycloalkyl; wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with lower alkyl, halogen or lower alkoxy;

the term cycloalkyl by itself of as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups; and

$(CH_2)_n$, $(CH_2)_p$ and $(CH_2)_q$ may be unsubstituted or include one or more alkyl substituents.

10. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

4,533,674

PROCESS FOR PREPARING A SUGAR AND STARCH FREE SPRAY-DRIED VITAMIN C POWDER CONTAINING 90 PERCENT ASCORBIC ACID

Douglass N. Schmidt, Grosse Ile; Jeffrey L. Finnan, Southgate, and Rudolph E. Lisa, Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 24, 1983, Ser. No. 544,608

Int. Cl.³ A61K *31/365*

U.S. Cl. 514—474 **3 Claims**

1. A process for preparing a free flowing, sugar free vitamin C powder which is color stable at use conditions, is compressible into tablets, comprising spray drying, in the absence of a lubricant, an aqueous slurry of ascorbic acid and binder in the presence of a silicon dioxide absorbent in amounts such that the resulting powder comprises at least 90 percent by weight of ascorbic acid, from 0 to 9 percent by weight of binder, from 0.5 to 2.0 percent by weight of absorbent.

4,533,675

CARBAMATES OF COLCHICINE FOR TREATMENT OF GOUT

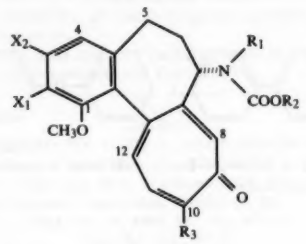
Arnold Brossi, and Peter Kerekes, both of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 17, 1984, Ser. No. 601,314

Int. Cl.[3] C07C *125/065, 125/067;* A61K *31/24*

U.S. Cl. 514—480 5 Claims

1. A compound of the colchicine and thiocolchicine series according to the following formula



where either X_1 or X_2 is a hydroxy group and the other a lower alkoxy group and R_1 can be H or an alkyl, R_2 an alkyl, alkenyl or aryl which may be substituted and R_3 is OCH_3; alkyl and alkoxy = C_1–C_6; aryl = monoaryl.

5. The method of treating gouty arthritis in mice which comprises injecting intraperitoneally per diem up to 20 mg/kg of a compound of the formula of claim 1.

4,533,676

2,5-DIHALOGENOBENZOYL-(THIO)UREA INSECTICIDES

Wilhelm Sirrenberg, Sprockhoevel; Erich Klauke, Odenthal, and Ingeborg Hammann, Muelheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

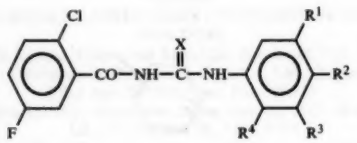
Filed Apr. 22, 1983, Ser. No. 487,799

Claims priority, application Fed. Rep. of Germany, May 11, 1982, 3217620

Int. Cl.[3] A01N *9/12, 9/20;* C07C *127/22*

U.S. Cl. 514—535 12 Claims

1. A 2,5-dihalogenobenzoyl-(thio)urea of the formula



in which

X represents sulphur or oxygen,

R^1 represents hydrogen, halogen, or optionally substituted radicals from the series comprising alkyl, alkoxy and alkylthio,

R^2 represents hydrogen, halogen, cyano, nitro or optionally substituted radicals from the series comprising alkyl, alkylthio, alkylsulphonyl, alkoxy, aryloxy, alkylcarbonyl, alkoxycarbonyl, alkoxycarbonylalkyl and alkoxycarbonylalkylthio,

R^1 and R^2 together represent an optionally substituted alkylenedioxy radical or represent —CF_2—O—CF_2—O—,

R^3 represents hydrogen, halogen, or an optionally substituted alkyl, alkoxy or aryloxy radical, and

R^4 represents hydrogen, halogen, or optionally substituted radicals from the series comprising alkyl, alkylthio and alkoxy.

11. A method of combating insects which comprises applying to such insects an insecticidally effective amount of a compound according to claim 1.

4,533,677

HYPOGLYCEMIC N-(2-SUBSTITUTED-3-DIALKYLAMINO-2-PROPENYLIDENE)-N-ALKYLALKANAMINIUM SALTS

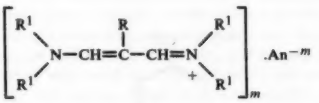
Eugene R. Wagner, Carmel; Charlotte L. Barney, and Donald P. Matthews, both of Indianapolis, all of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed May 16, 1983, Ser. No. 494,741

Int. Cl.[3] A61K *31/13*

U.S. Cl. 514—638 9 Claims

1. A method for lowering elevated blood glucose levels in a patient in need thereof which comprises internal administration of a hypoglycemically effective dose of a compound of the formula



wherein R represents a group of formula R^3X—; R^1 is methyl or ethyl; R^3 is selected from the group consisting of straight or branched chain alkyl having from 1 to 12 carbon atoms, straight or branched chain alkenyl having from 2 to 12 carbon atoms, cycloalkyl having from 3 to 8 carbon atoms, cycloalkylalkyl having from 4 to 10 carbon atoms, benzyl, or phenyl, optionally substituted by from 1 to 3 substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, hydroxy, benzyloxy, di(lower alkyl)amino, nitro, phenyl or benzyl or by a single 2,3- or 3,4-methylenedioxy moiety; X is an oxygen atom, or a divalent sulfur atom, An is a pharmaceutically acceptable anion, and m is an integer corresponding to the valence of the anion.

4,533,678

BASIC COMPOUND, ITS POLYMER, A PROCESS FOR THE PREPARATION THEREOF AND ITS USE AS ION EXCHANGE RESIN

Kunihiko Takeda, Yokohama, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

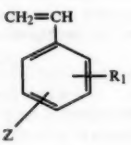
Filed Mar. 13, 1984, Ser. No. 589,210

Claims priority, application Japan, Mar. 23, 1983, 58-47112; Mar. 23, 1983, 58-47113; Mar. 23, 1983, 58-48477; Mar. 23, 1983, 58-48478; Mar. 29, 1983, 58-53316

Int. Cl.[3] C07D *235/04, 487/00;* C08F *8/32;* B01J *39/20*

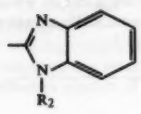
U.S. Cl. 521—389 37 Claims

1. A basic compound of Formula (1):

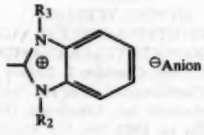


(1)

wherein R_1 is a hydrogen atom or a straight chain or branched hydrocarbon group having 1 to 4 carbon atoms, and Z is a group of Formula (2) or Formula (3):



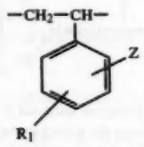
(2)



(3)

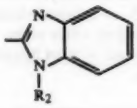
wherein R_2 and R_3 each independently is a hydrogen atom, a straight chain or branched hydrocarbon group having 1 to 10 carbon atoms or a carboxyalkyl group having 2 to 10 carbon atoms.

12. A cross-linked copolymer comprising about 98 to about 10 mol % of recurring units of Formula (4):

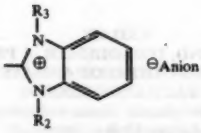


(4)

wherein R_1 is a hydrogen atom or a straight chain or branched hydrocarbon group having 1 to 4 carbon atoms, and Z is a group of Formula (2) or Formula (3):

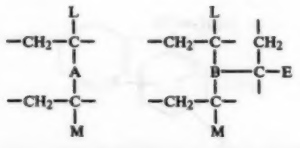


(2)



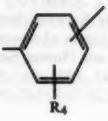
(3)

wherein R_2 and R_3 each independently is a hydrogen atom, a straight chain or branched hydrocarbon group having 1 to 10 carbon atoms or a carboxyalkyl group having 2 to 10 carbon atoms, about 2 to about 50 mol % of recurring units of Formula (5) plus Formula (6):

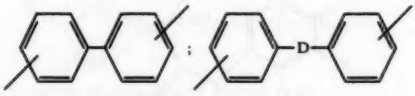


(5) (6)

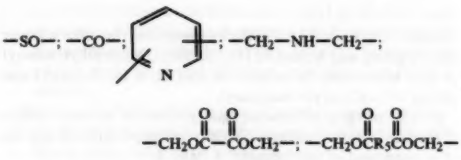
wherein L, M and E each independently is a hydrogen atom or a methyl group; A is



wherein R_4 is a hydrogen atom or a C_1–C_5 hydrocarbon residue;



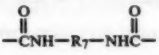
wherein D is —O—, —S—, —NH— or a divalent C_1–C_5 hydrocarbon residue;



wherein R_5 is a divalent C_1–C_8 hydrocarbon residue;

(2)

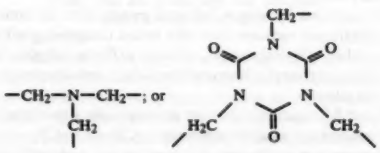
wherein R_6 is a divalent C_1–C_5 hydrocarbon residue; or



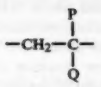
(3)

wherein R_7 is a divalent C_1–C_3 hydrocarbon residue; and B is

wherein R_8 is a hydrogen atom or a C_1–C_5 hydrocarbon residue;



and 0 to about 88 mol % of recurring units of Formula (7):



(7)

wherein P and Q each independently is a hydrogen atom, a halogen atom, a cyano group, an aryl group, a halogenophenyl group, a phenyl group substituted with one or more substituents selected from C_1–C_5 straight chain or branched alkyl and haloalkyl groups, —$COOR_9$ in which R_9 is a hydrogen atom or R_{10}, R_{10} is a C_1–C_{10} hydrocarbon residue, —COR_9, —O-COR_{10}, —$CONHR_9$, an imidazolyl group, a pyridyl group and a carbazolyl group,

based on the total moles of recurring units of Formula (4), Formula (5), Formula (6) and Formula (7).

4,533,679

REINFORCED POLYESTER COMPOSITION HAVING AN IMPROVED STRENGTH

Herbert L. Rawlings, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

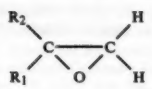
Filed Jun. 28, 1982, Ser. No. 392,846

Int. Cl.³ C08L *67/02*

U.S. Cl. 523—204 **1 Claim**

1. A process for the preparation of a glass fiber reinforced thermoplastic polyethylene terephthalate composition comprising

(i) applying a polyepoxy compound having more than two terminal epoxy functionalities per molecule to said glass fibers, said polyepoxy conforming to the general formula



wherein R_1 denotes a hydrogen atom or an alkyl radical and R_2 is a polyvalent radical containing more than one additional terminal epoxide functionality and then

(ii) incorporating the glass fibers of (i) in a thermoplastic polyethylene terephthalate resin,

said polyepoxy being applied in sufficient amount to cause a reinforcing effect of said composition.

4,533,680

THERMOPLASTIC RESIN COMPOSITION FOR MOLDING

Takuzo Kasuga, Tokyo, and Katsuhiko Takahashi, Fuji, both of Japan, assignors to Polyplastic Company, Ltd., Osaka, Japan

Filed Apr. 10, 1984, Ser. No. 598,651

Claims priority, application Japan, Apr. 13, 1983, 58-64800

Int. Cl.³ C08K *3/40, 3/34, 3/04*

U.S. Cl. 523—220 **16 Claims**

1. A thermoplastic resin composition having reduced deformation degree and improved impact resistance when molded which comprises a crystalline thermoplastic resin and

(a) a reinforcing fiber having a staple length not greater than about 1μ and a ratio of length to diameter in the range of from about 5 to about 1000, said fiber being present in a concentration in the range of from about 1 to about 60 weight percent;

(b) a flaky filler having an average diameter in the range of from about 100 to about 1000μ, an average thickness in the range of from about 0.1 to about 10μ and a diameter/-thickness ratio in the range of from about 4 to 400, said filler being present in a concentration in the range of from about 1 to about 50 weight percent; and

(c) a polycarbonate in a concentration in the range of from about 1 to about 50 weight percent,

all based on the total quantity of the resin composition.

4,533,681

CROSSLINKED FLOW CONTROL ADDITIVES FOR HIGH SOLIDS PAINTS I

Joseph C. Cassatta, Taylor, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1983, Ser. No. 468,912

Int. Cl.³ C08F *2/001*; C08L *61/32*

U.S. Cl. 523—400 **14 Claims**

1. A stable dispersion containing crosslinked polymer particles characterized in that they are formed by reactions comprising addition polymerization of:

(a) between about 0.5 and about 20 weight percent each of a first and second monomer selected from (i) first and second ethylenically unsaturated monomers each bearing functionality capable of crosslinking reaction with the other or (ii) first and second monomers, wherein said first monomer bears ethylenic unsaturation and functionality capable of crosslinking reaction with other functionality present on said second monomer, said second monomer bearing at least two functional groups of said other functionality and bearing no ethylenic unsaturation; and

(b) between about 99 and about 60 weight percent of at least one other monoethylenically unsaturated monomer,

in the presence of (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer, wherein the reaction is carried out at elevated temperatures such that the dispersion polymer is formed and is then crosslinked, said dispersion stabilizer comprising, on the average, more than one long hydrocarbon chain and at least one vinyl unsaturation and being the reaction product of:

(A) an adduct bearing pendant hydroxyl groups and being the reaction product of:

(a) a long chain hydrocarbon molecule bearing a carboxyl group and no other reactive group; and

(b) polyepoxide resin having (i) at least two epoxide groups and (ii) a number average molecular weight ($\overline{M}_n$) of between about 140 and 3000,

reacted in amounts so as to provide greater than about 1.0 mole of said long chain hydrocarbon molecules bearing a carboxyl group for each mole of said polyepooxide resin;

(B) saturated difunctional monomers containing the same or different first and second functional group, said first functional group being capable of reaction with said hydroxyl group of said adduct; and

(C) monomers bearing ethylenic unsaturation and bearing a functional group capable of reaction with said second functional group of said saturated difunctional monomers; wherein monomer pairs comprising said difunctional monomers (B) and said monomers (C) are selected from the group consisting of:

(i) C_4–C_{14} diisocyanates and C_5–C_{12} esters of acrylic or methacrylic acid bearing monohydroxyl functionality;

(ii) cyclic anhydride and glycidyl esters of acrylic or methacrylic acid; and

(iii) phosphorus anhydrides and glycidyl esters of acrylic or methacrylic acid.

wherein in said stabilizer formation said difunctional monomer is employed in amounts so as to provide at least about 1.0 mole of said saturated difunctional monomers for each mole of said polyepoxide resin, and wherein said difunctional momomers (B) and said monomers (C) are employed in a molar ratio of about 1:1.

4,533,682

IMIDAZOLIDINE-BLOCKED AMINE POLYMERS

Anthony J. Tortorello, Elmhurst; Nestor P. Hansen, Mt. Prospect, and Kathryn M. Jarocki, Chicago, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Apr. 29, 1983, Ser. No. 489,782
Int. Cl.³ C08L 63/00
U.S. Cl. 523—414 17 Claims

1. A protonated adduct reaction product which is an adduct of:

(1) an imidazolidine which is the reaction product of an unhindered ketone or aldehyde with a diprimary amine which is a mono- or poly-alkylene polyamine; with

(2) an organic polyepoxide having a 1,2-epoxy equivalency of at least about 1.2; said imidizolidine being used in an amount sufficient to react with at least 10% of the 1,2-oxirane groups in said polyepoxide; and said adduct being reacted with

(3) an acid to protonate at least 50% of the amine groups which are present.

4,533,683

RUST PREVENTIVE CATIONIC ELECTROCOATING

Ryoichi Murakami, Nara; Yoshiyuki Uyeda, Nishinomiya; Kanji Nishijima, Ibaraki, and Tetsuo Yanagihara, Neyagawa, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Apr. 27, 1983, Ser. No. 489,082
Claims priority, application Japan, Apr. 28, 1982, 57-72257
Int. Cl.³ C08K 3/10
U.S. Cl. 523—414 2 Claims

1. A rust preventive cationic electrocoating composition which comprises an electrocoating resin having a reactive group admixed with a paste comprising a chromate pigment in a water-insoluble or hardly soluble organic binder having a reactive group, said paste having a water content of not more than 2% and CrO_3 content such as to make the concentration of CrO_3 in the electrocoating composition 200 to 5000 ppm;

the reactive group in the electrocoating resin being cross-linkable with the reactive group in the organic binder;

the reactive group in the organic binder being a blocked isocyanate group, and the reactive group in the electrocoating resin being a hydroxyl group, a primary amino group or a secondary amino group; or

the reactive group in the organic binder being a hydroxyl group, a primary amino group or a secondary amino group and the reactive group in the electrocoating resin being a blocked isocyanate group.

4,533,684

THERMOSETTING COATING COMPOSITION USEFUL AS CHIP RESISTANT PRIMER II

Panagiotis I. Kordomenos, Mt. Clemens; Andrew H. Dervan, Fraser, and Dennis J. Grebur, Berkley, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 510,796, Jul. 5, 1983,. This application Dec. 22, 1983, Ser. No. 564,143
Int. Cl.³ C08L 63/02, 67/04
U.S. Cl. 523—436 27 Claims

1. A novel, organic solvent based, thermosetting coating composition comprising:

I. Epoxy-polyester graft copolymer having a number average molecular weight ($\overline{Mn}$) of between about 2,000 and about 20,000, said copolymer being prepared by polymerization of lactone monomers in the presence of hydroxy functional epoxy ester resin precursor which has a number average molecular weight ($\overline{Mn}$) of between about 1,000 and about 4,000 and which has been prepared by reacting chain extended diepoxide with hydroxy functional secondary amine in chain terminating reaction in approximately 1 to 1 equivalent ratio, and chain extended diepoxide being prepared by reacting diepoxide substantially simultaneously with diphenol and dicarboxylic acid in amounts sufficient to give a weight per epoxide (WPE) of between about 500 and about 2,500, and wherein said polymerization of said lactone monomers is carried out at a temperature between about 130° C. and about 200° C. and the polymerization reaction mixture comprises between about 10 and about 80 weight percent said hydroxy functional epoxy ester resin precursor and between about 20 and about 90 weight percent said lactone monomers; and

II. Blocked polyisocyanate crosslinking agent comprising at least one isocyanate group which has been blocked by reaction with an active hydrogen bearing blocking agent, said blocked polyisocyanate crosslinking agent being included in an amount such that upon de-blocking of the blocked isocyanate groups thereof at the cure temperature of the composition, said crosslinking agent will provide between about 0.5 and about 1.6 reactive isocyanate groups per reactive group on said epoxy-polyester graft copolymer.

4,533,685

POLYMER-METAL BLEND

Donald E. Hudgin, 33 Berkshire Dr., Princeton Junction, N.J. 08550, and Mohammad A. Semsarzadeh, 32-10 Quail Ridge, Plainsboro, N.J. 08536

Filed Jul. 26, 1983, Ser. No. 517,442
Int. Cl.³ C08K 3/08
U.S. Cl. 523—457 32 Claims

1. Electrically conducting metallized organic polymer blend prepared by melting the metal with the polymer, the metal having a melting point within the softening to molten range of the polymer.

4,533,686

CURABLE EPOXY RESIN COMPOSITIONS

Kevin Hirschbuehler, and Samuel E. Susman, both of Bel Air, Md., assignors to American Cyanamid Co., Stamford, Conn.

Filed Aug. 1, 1983, Ser. No. 518,875
Int. Cl.³ C08K 3/04
U.S. Cl. 523—468 6 Claims

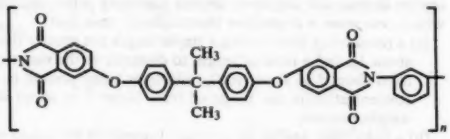
1. A fiber resin matrix composition comprised of:

(a) reinforcing filaments, and

(b) a heat curable epoxy resin composition formed from the following materials, in parts by weight:

(i) N,N,N',N'-tetraglycidyl-4,4'-diaminodiphenyl methane, 114–126 parts;

(ii) a polyetherpolyimide resin of the formula:



wherein n is an integer sufficient to provide a molecular weight of from 25,000 to 50,000, 14.25–15.75 parts;

(iii) 1,3-propylene-bis-(p-aminobenzoate 45.6–50.4 parts; and

(iv) boron trifluoride-organic amine complex, 0.475–0.525 parts.

4,533,687
FLAME-RETARDANT RUBBER COMPOSITION

Kunio Itoh; Toshimichi Oshima, and Tsutomu Nakamura, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1984, Ser. No. 575,504
Claims priority, application Japan, Jan. 31, 1983, 58-14458
Int. Cl.³ C08K 3/02, 3/22
U.S. Cl. 524—80 3 Claims

1. A flame-retardant polyolefin-based rubber composition which comprises:

(a) 100 parts by weight of a synthetic rubber of polyolefin type;

(b) 1 to 50 parts by weight of an organopolysiloxane resin formed from monofunctional siloxane units represented by the formula $R_3SiO_{0.5}$, in which R is a hydrogen atom, a substituted or unsubstituted monovalent hydrocarbon group, and tetrafunctional siloxane units of the formula SiO_2 in a molar ratio in the range from 0.6/1.0 to 2.0/1.0;

(c) from 1 to 20 parts by weight of red phosphorus; and

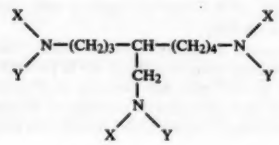
(d) from 5 to 200 parts by weight of aluminum hydroxide or magnesium hydroxide.

4,533,688
TRIS(PIPERIDYLAMINOTRIAZYLAMINO) COMPOUNDS, THEIR PREPARATION AND THEIR USE AS POLYMER STABILIZERS

Toshimasa Toda, and Tomoyuki Kurumada, both of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 562,707
Claims priority, application Japan, Dec. 28, 1982, 57-231356
Int. Cl.³ C08K 5/34
U.S. Cl. 524—100 28 Claims

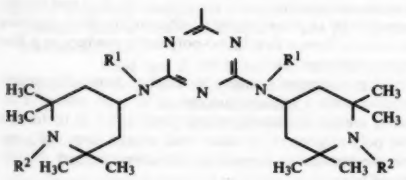
1. Compounds of formula (I):



(I)

[in which:

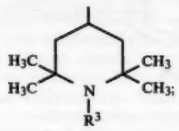
the groups represented by X are the same and have the formula (II):



(II)

(in which:

R^1 represents hydrogen, a C_1–C_{18} alkyl group, a C_2–C_{22} alkoxyalkyl group, a C_1–C_{18} acyl group, an aralkyl group optionally having at least one C_1–C_4 alkyl or halogen substituent or a group of formula (III):

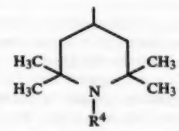


(III)

and

R^2 and R^3 are the same or different and each represents hydrogen, a C_1–C_{18} alkyl group, a C_1–C_{18} acyl group or an aralkyl group optionally having at least one C_1–C_4 alkyl or halogen substituent); and

Y represents hydrogen, a C_1–C_{18} alkyl group, a C_1–C_{18} acyl group, an aralkyl group optionally having at least one C_1–C_4 alkyl or halogen substituent or a group of formula (IV):



(IV)

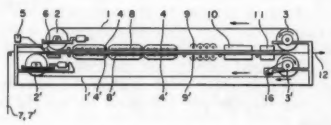
in which R^4 has any of the meanings defined for R^2];

and acid addition salts thereof.

4,533,689
FLAME RESISTANT ACRYLIC RESIN COMPOSITION AND PROCESS FOR ITS PRODUCTION

Suehiro Tayama, and Norihisa Kusakawa, both of Toyama, Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 523,763
Claims priority, application Japan, Sep. 1, 1982, 57-152349; Sep. 2, 1982, 57-153316
Int. Cl.³ C08K 5/50, 5/51; C08F 222/04
U.S. Cl. 524—130 13 Claims



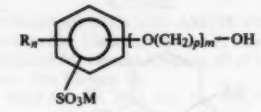
1. A flame resistant acrylic resin composition comprising a polymer composed of from 40 to 88% by weight of methyl methacrylate, from 1 to 15% by weight of α-methyl styrene, from 5 to 15% by weight of styrene, from 5 to 15% by weight of maleic anhydride and from 1 to 15% by weight of methacrylic acid, and a flame retardant.

4,533,690
FLAME RETARDANT POLYCARBONATE COMPOSITIONS

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Apr. 26, 1984, Ser. No. 603,920
Int. Cl.³ C08K 5/42
U.S. Cl. 524—161 19 Claims

1. A composition comprising an admixture of an aromatic polycarbonate and a flame retardant effective amount of a compound of the formula



wherein
M is an alkali or alkaline earth metal;
R is alkyl, halo, nitro trihalomethyl or cyano;
m is an integer of one two or three;
n is an integer of zero, one, two, three or four; and
p is an integer of two, three, four, five or six.

4,533,691

CHLORINE DIOXIDE ANTIMICROBIAL AGENT FOR LATEX

Hamdy Khalil, and Orest N. Chick, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Filed Dec. 12, 1983, Ser. No. 560,226
Int. Cl.³ C08K *3/16*
U.S. Cl. 524—401 **17 Claims**

1. A latex having improved resistance to the growth of bacteria comprising from about 35 to 75 parts by weight of one or more polymers selected from the group:

homopolymers of C_{4-6} conjugated diolefins, chloroprene polymers, vinyl pyridine polymers, homopolymers of vinylidene monoaromatic monomers, copolymers of ethylene and propylene, copolymers of acrylonitrile and butadiene; or

copolymers of butadiene and styrene, copolymers of butadiene and styrene containing one or more monomers selected from the group alpha,beta ethylenically unsaturated carboxylic acids, amide derivatives of alpha,beta ethylenically unsaturated acids which are unsubstituted or substituted at the nitrogen atom by a C_{1-8} alkyl or a C_{1-4} alkanol radical, or a C_{1-8} alkyl ester of an alpha,beta ethylenically unsaturated carboxylic acid; and

per 100 parts by weight to polymer solids in said latex a sufficient amount of an agent selected from the group:

chlorine dioxide gas, aqueous solutions of chlorine dioxide, a mixture of an alkali metal chlorate and a mineral acid, a mixture of an alkali metal chlorate and an organic acid, or an organic anhydride, a mixture of an alkali metal chlorate and an organic peroxide or hydrogen peroxide, a mixture of an alkali metal chlorate and a reducing agent, a mixture of an alkali metal chlorite and mineral acid, a mixture of an alkali metal chlorite and an organic acid or an organic anhydride, a mixture of an alkali metal chlorite and an organic peroxide or hydrogen peroxide, a mixture of an alkali metal chlorite and a reducing agent or a mixture of an alkali metal chlorite and chlorine,

to provide from about 0.005 to about 0.2 parts by weight of chlorine dioxide per 100 parts by weight of polymer solids.

4,533,692

LIQUID CRYSTALLINE POLYMER COMPOSITIONS, PROCESS, AND PRODUCTS

James F. Wolfe, Redwood City, Calif.; Paul D. Sybert, and Joanne R. Sybert, both of Cohoes, N.Y., assignors to SRI International, Menlo Park, Calif.

PCT No. PCT/US82/01285, § 371 Date Sep. 17, 1982, § 102(e) Date Sep. 17, 1982, PCT Pub. No. WO84/01160, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 17, 1982, Ser. No. 433,831
Int. Cl.³ C08K *3/32*
U.S. Cl. 524—417 **121 Claims**

1. A novel polymer composition of workable viscosity which is useful as a dope in the production of fibers and films comprising a liquid crystalline polymer solution of polyphosphoric acids containing at least one high molecular weight extended chain polymer having one or more mesogenic group or groups, said extended chain polymer(s) having a molecular weight of at least 10,000 as determined by intrinsic viscosity and being present in sufficient concentration so as to produce a liquid crystalline polymer phase in said solution, with the proviso that when the polymer is poly([benzo-(1,2-d:4,5-d')bisthiazole-2,6-diyl]-1,4-phenylene) that said poly([benzo-(1,2-d:4,5-d')-bisthiazole-2,6-diyl]-1,4-phenylene) polymer concentration be greater than 10 percent by weight based on the total weight of said composition and that the molecular weight of said poly([benzo-(1,2-d:4,5-d') bisthiazole-2,6-diyl]-1,4-phenylene) correspond to an intrinsic viscosity of at least about 12 dL/g as determined in methanesulfonic acid at 30° C.

4,533,693

LIQUID CRYSTALLINE POLYMER COMPOSITIONS, PROCESS, AND PRODUCTS

James F. Wolfe, Redwood City, Calif.; Paul D. Sybert, and Joanne R. Sybert, both of Cohoes, N.Y., assignors to SRI International, Menlo Park, Calif.

PCT No. PCT/US83/01437, § 371 Date Sep. 15, 1983, § 102(e) Date Sep. 15, 1983, PCT Pub. No. WO84/01162, PCT Pub. Date Mar. 29, 1984
Continuation-in-part of Ser. No. 433,831, filed as PCT 82/01285 Sep. 17, 1982, published as WO84/01160 Mar. 29, 1984, § 102(e) date Sep. 17, 1982, abandoned. This PCT application Sep. 15, 1983, Ser. No. 616,469
Int. Cl.³ C08K *3/32*
U.S. Cl. 524—417 **346 Claims**

120. A process for preparing a liquid crystalline extended chain polymer composition of workable viscosity which is useful in the production of fibers and films comprising the following steps:

(a) mixing at least one of a selected first homo- or heterobifunctional monomer with or without oxidation protecting atoms or groups with a preliminary solvent of phosphoric acid having a relatively low phosphorus pentoxide content,

(b) heating and optionally placing the resulting mixture under reduced pressure to remove any volatilized protecting atoms or groups present and provide a first mixture of the first monomer(s) in the preliminary solvent,

(c) adding at least one of a selected second monomer in the resulting mixture of step (b) when said selected first monomer is a homo-bifunctional monomer so as to provide a first mixture of the first and second monomers in the preliminary solvent,

(d) then increasing the phosphorus pentoxide content of the mixture resulting from step (b) or (c) to provide a first or a first and second monomer reaction medium of greater phosphorus pentoxide content suitable for polymerization and for achieving a degree of polymerization greater than about 40,

(e) causing polymerization of the first or the first and second monomer(s) at a temperature sufficient to effect reaction at a rate to form a first homo-oligomeric product or a first co-oligomeric product having a preselected intrinsic viscosity, or

(f) causing polymerization of the first or the first and second monomer(s) at a temperature sufficient to effect reaction at a rate to form a first homo-polymeric product or a first copolymeric product,

(g) mixing a selected amount of the first homo-oligomeric product with a selected amount of at least one of a selected second homo-oligomeric product so as to form a first poly-oligomeric product, said second homo-oligomeric product being formed by like steps (a) and (b) followed by:

(1g) adding at least one of a selected second monomer in the resulting mixture of step (b) when said selected first monomer is a homo-bifunctional monomer so as to provide a mixture of a first and second monomer in the preliminary solvent,

(2g) then increasing the phosphorus pentoxide content of

the mixture resulting from step (b) or (1g) to provide a first or a first and second monomer reaction medium of greater phosphorus pentoxide content suitable for polymerization,

(3g) causing polymerization of the first or first and second monomer(s) at a temperature sufficient to effect reaction at a rate to form said second homo-oligomeric product having a preselected intrinsic viscosity,

with the overall proviso that at least one of the selected monomer(s) of step (a) or (1g) which forms the second homo-oligomeric product be different from at least one of the selected monomer(s) of step (a) or (c) which forms the first homo-oligomeric product, or

(h) mixing a selected amount of the first homo-oligomeric product with a selected amount of a second mixture of at least one of a selected first monomer or a first and second monomer in the preliminary solvent so as to form a monomer-oligomer mixture, and then increasing the phosphorus pentoxide content of said monomer-oligomer mixture to provide a monomer-oligomer reaction medium of greater phosphorus pentoxide content suitable for polymerization, said first monomer of said second mixture being formed by like steps (a) and (b) and said first and second monomer of said second mixture being formed by like steps (a), (b) and (c), with the overall proviso that at least one of the selected monomer of step (a) or (c) which forms the first or first and second monomer(s) of said second mixture, be different from at least one of the selected monomer(s) of step (a) or (c) which forms the first homo-oligomeric product,

(i) causing polymerization of the poly-oligomeric product resulting from step (g) or the monomer-oligomer resulting from step (h) at a temperature sufficient to effect reaction at a rate to form a first block-oligomeric product having a preselected intrinsic viscosity or a first blockpolymeric product.

4,533,694

FORMULATION FOR ELECTRODEPOSITION OF MICA

Richard K. Elton, Altamont, and William R. Schultz, Jr., Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 555,044, Nov. 25, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 672,776

Int. Cl.³ C09D *5/40;* **C25D** *13/00;* **C08K** *3/10;* **C08L** *67/02*

U.S. Cl. 524—449 **9 Claims**

1. An electrodeposition composition consisting essentially in weight percent of 5 to 35% of particulated mica, 0.2 to 2% of a water soluble anionic resin binder as calculated in resin solids, 0.001 to 0.20% of electrolyte, and the remainder a polar solvent.

4,533,695

NON-AQUEOUS DISPERSIONS BASED ON CAPPED STABILIZERS AND REACTANTS COMPRISING POLYFUNCTIONAL MONOMERS II

Ares N. Theodore, Farmington Hills, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 5, 1983, Ser. No. 455,696

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.³ C08K *5/01;* **C08L** *51/08*

U.S. Cl. 524—504 **14 Claims**

1. A stable dispersion containing crosslinked polymer particles characterized in that said particles are formed by reactions comprising addition polymerization of:

(a) between about 0.5 and about 20 weight percent each of first and second monomers wherein said first monomer bears ethylenic unsaturation and functionality capable of crosslinking reaction with other functionality present on said second monomer, said second monomer bearing at least two functional groups of said other functionality and bearing no ethylenic unsaturation; and

(b) between about 99 and about 60 weight percent of at least one other monoethylenically unsaturated monomer;

in the presence of (I) an organic liquid which is a solvent for the polymerizable monomers, but a non-solvent for the resultant polymer, and (II) polymeric dispersion stabilizer, wherein the reaction is carried out at elevated temperatures such that the dispersion polymer first forms and then is crosslinked, and wherein said stabilizer comprises the reaction product of:

(A) acrylic polymer-adduct having hydroxyl functionality and being the reaction product of:

(a) long chain hydrocarbon molecules having only one reactive group; and

(b) acrylic polymer (i) having a number average molecular weight of between about 1000 and about 10,000 and (ii) containing pendant functionality capable of reacting with said reactive group of said hydrocarbon molecule;

wherein said hydroxyl functionality on said acrylic polymer-adduct is either initially present on said acrylic polymer, generated in situ, or both initially present and generated in situ and wherein said hydrocarbon molecule and said acrylic polymer are reacted in amounts so as to provide at least 1.0 moles of said hydrocarbon molecules per each mole of said acrylic polymer; and

(B) ethylenically unsaturated monoisocyanates; wherein said adduct (A) and said monoisocyanates (B) are reacted in amounts so as to provide between about 0.1 and about 1.0 reactive isocyanates per each hydroxyl functionality present on said acrylic polymer-adduct (A).

14. Crosslinked polymer particles obtained by removal of said solvent from said dispersion formed in claim 1.

4,533,696

POLYMER POWDER COMPOSITIONS, PARTICULARLY POLYETHYLENE POWDER COMPOSITIONS AND OBJECTS TO BE MADE AND MADE THEREOF

Jan Schrijver, Roosteren, and Arnold Vossebeld, Beek, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Feb. 18, 1983, Ser. No. 467,921

Claims priority, application Netherlands, Feb. 20, 1982, 8200688; Apr. 24, 1982, 8201711

Int. Cl.³ C08K *5/00;* **C08J** *3/20;* **C08L** *23/04*

U.S. Cl. 524—528 **8 Claims**

1. An improved polymer composition for rotational molding having about 1 wt.-% to about 99 wt.-% of a polyolefin polymer powder component A and about 99 wt.-% to about 1 wt.-% of polyolefin powder component B, component A having an average particle size of at least about 0.050 mm up to at most about 0.250 mm and component B having an average particle size of at most 1 mm, the improvement consisting essentially in that the average particle size of said component A is at least about 0.050 mm smaller than the average particle size of component B, component B containing at most 0.01 wt.-% stabilizer and component A containing at least 0.025 wt.-% stabilizer, said composition during rotational molding forming a stabilized outer layer and a non-stabilized inner layer.

4,533,697

PROCESS FOR PREPARING POLYVINYL BUTYRAL

Robert Degeilh, Le Port-Marly, France, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Feb. 18, 1983, Ser. No. 467,647

Claims priority, application France, Feb. 23, 1982, 82 02918

Int. Cl.³ C08G *18/56*

U.S. Cl. 525—61 **10 Claims**

1. A process for preparing polyvinyl butyral by reaction of polyvinyl alcohol in aqueous solution and butyraldehyde in the presence of an acid catalyst and an emulsifying agent, which

comprises forming an initial reaction medium of a mixture of water and a portion of polyvinyl alcohol to be reacted in an amount sufficient to allow stirring, maintaining the initial reaction medium containing between about 2.5 and 7.5% by weight of polyvinyl alcohol, maintaining the initial reaction medium initially at a temperature between about 5° and 20° C., simultaneously but separately introducing a stream of a polyvinyl alcohol aqueous solution in an amount sufficient to provide the remaining amount of polyvinyl alcohol to be used in the reaction and a stream of butyraldehyde, and maintaining the reaction at a temperature below about 40° C. during the simultaneous but separate introduction of the polyvinyl alcohol and the butyraldehyde.

4,533,698

THERMOPLASTIC RESIN COMPOSITION

Tetsuro Maeda; Akihiro Okamoto; Yoshimitsu Shimizu, and Takashi Nomoto, all of Ichihara, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1983, Ser. No. 482,444

Claims priority, application Japan, Apr. 13, 1982, 57-61394

Int. Cl.³ C08L *39/04, 51/00*

U.S. Cl. 525—73 **10 Claims**

1. A thermoplastic resin composition, which consists essentially of:

(A) 100 parts by weight of a rubber-containing styrene type resin; and

(B) 1 to 45 parts by weight of a polymeric substance selected from the group consisting of a homopolymer of an acrylic acid ester, copolymers of an acrylic acid ester, and a mixture of these polymers, said component (B) having a solubility parameter of from 8.4 to 9.8 $(cal/c.c.)^{\frac{1}{2}}$, a glass transition temperature of 20° C. or below, a gel content of 70% by weight or below, and relative viscosity in methylethyl ketone of 20 or below.

4,533,699

COPOLYMERIZED UNSATURATED PEROXYCARBONATE SIZING AGENT FOR TREATMENT OF GLASS FIBERS AND METHOD FOR TREATMENT OF GLASS FIBERS WITH SAID SIZING AGENT

Takeshi Komai, Aichi; Kazuo Matsuyama, Gamagori, and Takuya Saigo, Aichi, all of Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

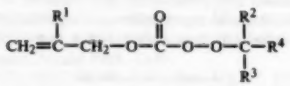
Filed May 30, 1984, Ser. No. 615,211

Claims priority, application Japan, May 30, 1983, 58-93981

Int. Cl.³ C08F *230/08;* **B05D** *3/02*

U.S. Cl. 525—277 **17 Claims**

1. A sizing agent for the treatment of glass fibers, comprising as principal components (1) a copolymer obtained as a film-forming agent, by copolymerizing an unsaturated peroxycarbonate represented by the general formula:



wherein R^1 denotes one member selected from the class consisting of a hydrogen atom and alkyl groups of 1 to 4 carbon atoms, R^2 and R^3 independently denote one member selected from the class consisting of alkyl groups of 1 to 4 carbon atoms, and R^4 denotes one member selected from the class consisting of alkyl groups of 1 to 12 carbon atoms and cycloalkyl groups of 3 to 12 carbon atoms, and another unsaturated monomer containing 70 to 100% by weight of vinyl acetate and, (2) a coupling agent selected from the group consisting of organic silicon compounds and organic chromium compounds.

4,533,700

HYDROCARBON RESIN AND MODIFIED HYDROCARBON RESIN PRODUCT THEREOF

Kinya Mizui; Masami Takeda, both of Otake, and Tadao Iwata, Chiba, all of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 413,899, Sep. 1, 1982,. This application Jan. 19, 1984, Ser. No. 551,370

Claims priority, application Japan, Sep. 7, 1981, 56-140738

Int. Cl.³ C08L *23/26, 25/08, 47/00*

U.S. Cl. 525—285 **20 Claims**

1. A hydrocarbon resin modified by addition reacting an ethylenically unsaturated carboxylic acid or its derivative, or hydrogen, to a copolymer of (A) at least one unsaturated hydrocarbon selected from the group consisting of (i) unsaturated chain hydrocarbons and (ii) cyclic hydrocarbons having a vinylidene group, and (B) at least one compound selected from the group consisting of 9,10-dihydrodicyclopentadiene and its derivatives, the amount of the polymerization unit of component (A) in the copolymer being 20 mol% to 98 mol% and that of component (B) in the copolymer being 80 mol% to 2 mol%.

4,533,701

ADHESIVE COATING MATERIAL

Koshi Kusumoto, Kamakura; Toshio Kawaguchi, Fujisawa, and Takayuki Ogata, Yokohama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Aug. 16, 1983, Ser. No. 523,567

Claims priority, application Japan, Aug. 16, 1982, 57-141010

Int. Cl.³ C08F *8/42*

U.S. Cl. 525—370 **14 Claims**

1. An adhesive coating material for a hard tissue, which comprises (1) a polymer having an acid value of 30 to 700 and repeating units of the polymer including a hydrophobic group and repeating units of the polymer including two carboxyl (—COOH) groups bonded to the polymer, said carboxyl groups being bonded to adjacent carbon atoms, and (2) an organic titanate compound.

4,533,702

AROMATIC POLYESTER CARBONATES HAVING A HIGH NOTCHED IMPACT STRENGTH AND A PROCESS FOR THE PRODUCTION THEREOF

Dieter Freitag; Ludwig Bottenbruch, and Manfred Schmidt, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 504,292, Jun. 15, 1983, abandoned. This application Jun. 22, 1984, Ser. No. 623,823

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1982, 3223980

Int. Cl.³ C08L *67/02, 69/00;* **C08G** *63/64*

U.S. Cl. 525—439 **6 Claims**

1. A process for the production of aromatic polyester carbonates having a molar ratio of ester groups to carbonate groups of from 20:1 to 1:20, characterised in that a solvent-containing mixture which contains (a) aromatic polyester and (b) aromatic polycarbonate in the required ratio, and from 5 to 80%, by weight, of organic solvent based on solvent-containing mixture is melt-extruded at a temperature of from 200 to 440° C. for a residence time of from 20 to 200 sec., while removing the solvent, and maintaining the liquid condition, until the reaction product only has one glass transition temperature.

4,533,703

FLEXIBLE BASECOAT/TWO COMPONENT CLEARCOAT COATING COMPOSITION

Panagiotis I. Kordomenos, Mt. Clemens; Kenneth R. Kurple, Anchorville, and Delores J. Alexander, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 555,463, Oct. 13, 1983, abandoned. This application May 29, 1984, Ser. No. 615,700

Int. Cl.[3] C08L 75/06

U.S. Cl. 525—440 20 Claims

1. A flexible basecoat/clearcoat coating composition, useful as automotive finish coats on metal and plastic substrates, which is characterized in that:

I the clearcoat coating composition comprises:

(A) hydroxy-containing urethane modified polyester (i) having a number average molecular weight ($\overline{M}_n$) of between about 1000 and about 10,000, (ii) having a hydroxy number of between about 30 and about 200, and (iii) containing between about 1 and about 10 urethane groups per molecule, and being made from reactants comprising:

(1) urethane modified diol made by reacting:

(a) diol, and

(b) diisocyanate,

wherein said diol and said diisocyanate are reacted in a molar ratio of from about 4:1 to about 4:3;

(2) polyol comprising at least about 5 weight percent triol; and

(3) acid component selected from dicarboxylic acids and anhydrides thereof;

(B) polyisocyanate crosslinking agent; and

II the basecoat composition comprises:

(A) hydroxy-containing urethane modified polyester (i) having a number average molecular weight ($\overline{M}_n$) of between about 1000 and about 10,000, (ii) having a hydroxyl number of between about 50 and about 250, and (iii) containing between about 1 and about 7 urethane groups per molecule, and being made from reactants comprising:

(1) hydroxy functional polyester prepared from a mixture of (a) polyhydroxy materials comprising diols and triols with (b) acid component selected from dicarboxylic acids and anhydrides thereof; and

(2) diisocyanate;

wherein in forming the hydroxy functional polyester, the proportion of reactants (a) and (b) are selected so that the OH/COOH ratio is from 6:2 to 6:5; and wherein in forming the modified polyester the proportion of hydroxy functional polyester (1) and the diisocyanate (2) are selected so as to provide from 4:1 to 10:1 hydroxyl/isocyanate groups; and

(B) amine-aldehyde crosslinking agent; and

(C) pigment; and

wherein either or both of said basecoat composition and said clearcoat composition individually comprises 0–60 weight percent, based on the total weight of (A) and (B) of the composition, of a linear polyurethane having a number average molecular weight of between about 15,000 and about 40,000.

4,533,704

FLEXIBLE BASECOAT/CLEARCOAT COATING COMPOSITIONS

Delores J. Alexander, Southfield; Kenneth R. Kurple, Anchorville, and Panagiotis I. Kordomenos, Mt. Clemens, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01599, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO85/01695, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 13, 1983, Ser. No. 592,124

Int. Cl.[3] C08L 75/06

U.S. Cl. 525—440 15 Claims

1. A flexible basecoat/clearcoat coating composition, useful as automotive finish coats on metal and plastic substrates, which is characterized in that:

I. The clearcoat composition comprises:

(A) hydroxy-containing urethane modified polyester (i) having a number average molecular weight ($\overline{M}_n$) of between about 1000 and about 10,000, (ii) having a hydroxyl number of between about 30 and about 200, and (iii) containing between about 1 and about 10 urethane groups per molecule, and being made from reactants comprising:

(1) urethane modified diol made by reacting:

(a) diol; and

(b) diisocyanate,

wherein said diol and said diisocyanate are reacted in a molar ratio of from about 4:1 to about 4:3;

(2) polyol comprising at least about 5 weight percent triol; and

(3) acid component selected from dicarboxylic acids and anhydrides thereof;

(B) amine-aldehyde crosslinking agent; and

II. the basecoat composition comprises:

(A) hydroxy-containing urethane modified polyester (i) having a number average molecular weight ($\overline{M}_n$) of between about 1000 and about 10,000, (ii) having a hydroxyl number of between about 50 and about 250, and (iii) containing between about 1 and about 7 urethane groups per molecule, and being made from reactants comprising:

(1) hydroxy functional polyester prepared from a mixture of (a) polyhydroxy materials comprising diols and triols and (b) acid component selected from dicarboxylic acids and anhydrides thereof; and

(2) diisocyanate;

wherein in forming the hydroxy functional polyester, the proportion of reactants (a) and (b) are selected so that the OH/COOH ratio is from 6:2 to 6:5; and wherein in forming the modified polyester the proportion of hydroxy functional polyester (1) and the diisocyanate (2) are selected so as to provide from 4:1 to 10:1 hydroxyl/isocyanate groups; and

(B) amine-aldehyde crosslinking agent; and

(C) pigment; and

wherein either or both of said basecoat composition and said clearcoat composition individually comprises 0–60 weight percent, based on the total weight of (A) and (B) of each said composition, of a linear polyurethane having a number average molecular weight of between about 15,000 and about 40,000.

4,533,705

PROCESS FOR PRODUCING α-OLEFIN POLYMERS

Akihiro Sato, Chibaken; Kazutsune Kikuta, Ichiharashi; Toshihiro Uwai, Ichiharashi; Kenji Matsuda, Ichiharashi, and Nobutaka Hattori, Chibashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 261,642, May 7, 1981, abandoned, which is a continuation-in-part of Ser. No. 225,436, Jan. 1, 1981, abandoned. This application Jul. 21, 1983, Ser. No. 515,975

Claims priority, application Japan, Jan. 17, 1980, 55-4009

The portion of the term of this patent subsequent to Jan. 5, 1999, has been disclaimed.

Int. Cl.[3] C08F 4/64, 10/06

U.S. Cl. 526—114 5 Claims

1. A process for producing ethylene and/or propylene polymers which comprises polymerizing ethylene and/or propylene at 20° to 200° C. under 0 to 50 Kg/cm^{2}G, for 5 minutes to 10 hours, in the presence of a preactivated catalyst obtained by:

(a) obtaining a solid product by reacting together at a temperature of −50° C. to 200° C. and for 10 minutes to 10 hours:

(1) 100 g of a reduction solid,

(2) 79 to 126 g of an electron donor, and

(3) 181 to 300 g of an electron acceptor,

said reduction solid being prepared by reducing $TiCl_4$ with an organoaluminum compound having a formula $Al.R_nR'_{n'}X_{3-(n+n')}$, wherein R, R' are hydrocarbon radical with from 1 to 10 carbon atoms or alkoxy radical with

from 1 to 2 carbon atoms, X is a halogen, and n, n' are optional numbers contained in the formula $0.0<n+n'\leqq 3$

said electron donor being an organic substance having one or more atoms selected from O, N, S or P,

said electron acceptor being a halide of an element of Groups III–VII of the Periodic Table,

(b) combining 1 g of said solid product with

(1) 6.0 to 14 g of said organoaluminum compound, and

(2) 0.3 to 240 g of an alpha-olefin having 2–8 carbon atoms, and

at a temperature of 0° C. to 100° C. for 1 minute to 20 hours so as to thereby polymerize 0.005 to 500 g of said alpha-olefin per 1 g of said solid product

(c) and adding 1 g of said solid product with 100 to 6,000 mg of the reaction product of trialkylaluminum having a formula AlR_3 (wherein R is hydrocarbon radical with from 1 to 10 carbon atoms) with said electron donor.

4,533,706

CATALYST AND PROCESS USING SAME FOR PRODUCING OLEFIN POLYMER

Akinobu Shiga; Toshio Sasaki, and Junpei Kojima, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 13, 1983, Ser. No. 561,324

Claims priority, application Japan, Dec. 16, 1982, 57-221659; Dec. 16, 1982, 57-221660

Int. Cl.³ C08F *4/44, 110/02*

U.S. Cl. 526—119 **18 Claims**

1. A catalyst system for the polymerization of olefins which comprises:

(A) a hydrocarbyloxy group-containing solid catalyst component, said component being prepared by (i) reducing a titanium compound represented by the general formula

$$Ti(OR^1)_nX_{4-n}$$

wherein, R^1 represents a hydrocarbon radical having 1–20 carbon atoms, X represents a halogen atom, and n represents a number satisfying $0.3\leqq n\leqq 4$, with an organoaluminum compound represented by the general formula

$$AlR^2_mY_{3-m}$$

wherein, R^2 represents a hydrocarbon radical having 1–20 carbon atoms, Y represents a halogen atom, and m represents a number satisfying $1\leqq m\leqq 3$, in the absence of ether and (ii) treating the resulting, hydrocarbon solvent-insoluble, hydrocarbyloxy group-containing solid product in a slurry state with an ether compound and titanium tetrachloride at a temperature of 30° to 120° C., and

(B) an organoaluminum compound.

4,533,707

SUPPORTED TRANSITION METAL COMPOSITION

Ian D. McKenzie, Welwyn Garden City, England, assignor to Imperial Chemical Industries, PLC, England

Division of Ser. No. 405,984, Aug. 6, 1982, Pat. No. 4,465,782. This application Jun. 18, 1984, Ser. No. 621,462

Claims priority, application United Kingdom, Aug. 7, 1981, 8124150

Int. Cl.³ C08F *4/44*

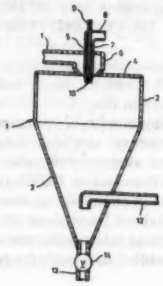
U.S. Cl. 526—125 **9 Claims**

1. A process for the production of a polymer or copolymer of an unsaturated monomer wherein at least one ethylenically unsaturated hydrocarbon monomer is contacted, under polymerisation conditions, with a polymerisation catalyst which is the product obtained by mixing together

(1) A transition metal composition; and

(2) an organic compound of aluminium or of a metal of Group IIA of the Periodic Table or a complex of an organic compound of a metal of Group IA or Group IIA of the Periodic Table together with an organic aluminium compound,

wherein the transition metal composition which is component, (1) of the polymerisation catalyst is the product obtained by a process in which a solid support material which is a metal



halide is suspended in a liquid medium which is a liquid hydrocarbon or a liquid halohydrocarbon, the suspension is spray-dried, the spray-dried support material is collected and the collected spray-dried support material is contacted with at least one compound of a transition metal of Group IVA, VA, or VIA of the Periodic Table.

4,533,708

POLYAMPHOLYTE POLYMER

Christine A. Costello, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 331,102, Dec. 15, 1981, abandoned. This application May 17, 1982, Ser. No. 378,921

Int. Cl.³ C08F *220/06, 220/56, 226/04*

U.S. Cl. 526—295 **3 Claims**

1. A polyampholyte polymer, having an intrinsic viscosity of 0.05 to 4.5 dl/g in 1.0 M NaCl, prepared from 32.5 to 90 percent acrylic acid and/or methacrylic acid, 1.5 to 65 percent, by weight, of acrylamide and 0.5 to 25 percent, by weight, of dimethyldiallyl ammonium chloride and/or diethyldiallyl ammonium chloride.

4,533,709

USE OF FUMARIC ACID POLYMERS AS ANTISCALANTS

Stanley W. Walinsky, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 441,189, Nov. 12, 1982, Pat. No. 4,486,581, which is a division of Ser. No. 295,209, Aug. 24, 1981, abandoned, which is a continuation of Ser. No. 108,068, Dec. 28, 1979, abandoned. This application Sep. 28, 1984, Ser. No. 655,408

Int. Cl.³ C08F *222/16*

U.S. Cl. 526—318 **8 Claims**

1. An intermediate polymer consisting of from about 50 to 100 mole percent monoalkyl fumarate, from 0 to about 50 mole percent of at least one hydrophilic monomer selected from acrylamide, methacrylamide, acrylic acid, methacrylic acid or maleic anhydride and from 0 to about 15 mole percent of at least one ethylenically unsaturated, hydrophobic monomer, the average molecular weight of the polymer being from about 500 to about 15,000 and the alkyl group of the monoalkyl fumarate being 1 to 8 carbons in length.

4,533,710
1,2-ALKANEDIOL DIACRYLATE MONOMERS AND POLYMERS THEREOF USEFUL AS CAPACITOR DIELECTRICS

Daniel R. Olson, Schnectady, and Timothy W. O'Donnell, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,893

Int. Cl.[3] **C07C** *69/54;* **C08F** *20/20, 120/20;* **H01B** *3/42*

U.S. Cl. 526—323.2 **4 Claims**

1. 1,2-Hexadecanediol diacrylate.

4,533,711
POLYBUTADIENE RUBBER COMPOSITIONS HAVING IMPROVED GREEN STRENGTH

Yasumasa Takeuchi, Yokohama; Mitsuhiko Sakakibara; Nobuo Tagata, both of Yokkaichi; Masaki Ogawa, Sayama; Yasushi Hirata, Higashimurayama, and Shigeru Tomihira, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited and Japan Synthetic Rubber Co., Ltd., Japan

Filed Sep. 7, 1983, Ser. No. 530,169

Claims priority, application Japan, Sep. 7, 1982, 57-154585

Int. Cl.[3] **C08F** *36/06*

U.S. Cl. 526—340.4 **2 Claims**

1. A polybutadiene rubber composition having an improved green strength, which comprises a polybutadiene having a content of cis-1,4 bond of at least 70%, an average chain length of 1,4-bond of 110~450, a molecular weight distribution represented by a ratio of weight-average molecular weight ($\overline{M}w$) to number-averge molecular weight ($\overline{M}n$) of not less than 5.0 and containing at least 1% by weight of a component having a molecular weight of not less than 25,000,000 as polystyrene measured by gel permeation chromatograph.

4,533,712
PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT ORGANOALUMINUM POLYMERS

Isoji Taniguchi, Kyoto; Yoshiharu Kimura, Ohmihachiman, and Toshiaki Ichimura, Toyonaka, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

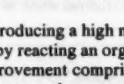
Filed Mar. 5, 1984, Ser. No. 586,075

Claims priority, application Japan, Mar. 30, 1983, 58-56266; May 7, 1983, 58-79837

Int. Cl.[3] **C08G** *67/00, 63/66, 63/68*

U.S. Cl. 528—9 **10 Claims**

1. A process for producing a high molecular weight organoaluminum polymer by reacting an organoaluminum compound with water, the improvement comprising using as reactants an organoaluminum compound represented by the general formula:



(wherein X and Y may be the same or different and are each a hydrogen atom, an alkyl group, or an alkoxyl group, and R is at least one organic radical) and an organic acid in an amount of from 0.2 to 10 moles per mole of the organoaluminum compound.

4,533,713
FLUOROALIPHATICSULFONAMIDES CONTAINING OXIRANE GROUPS AND/OR N-β-HYDROXYALKYLENE GROUPS

Richard D. Howells, P.O. Box 33427, St. Paul, Minn. 55133, assignor to Minnesto Mining and Manufacturing Company, St. Paul, Minn.

Filed May 6, 1983, Ser. No. 492,452

Int. Cl.[3] **C08G** *59/30, 59/28*

U.S. Cl. 528—26 **17 Claims**

1. A compound containing
(A) a fluoroaliphaticsulfonamido moiety, and
(B) a moiety containing
(1) at least two oxirane groups,
(2) at least two non-terminal N-β-hydroxyalkylene groups, or
(3) at least one oxirane group and at least one non-terminal N-β-hydroxyalkylene group.

15. A composition which comprises
(a) the compound of claim 1, and
(b) a curing agent.

4,533,714
POLYQUATERNARY POLYSILOXANE POLYMERS

Henri Sebag, and Alexandre Zysman, both of Paris, France, assignors to L'Oreal, Paris, France

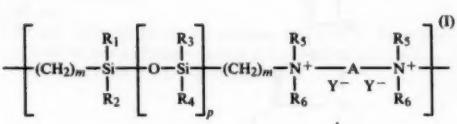
Filed Nov. 7, 1983, Ser. No. 550,418

Claims priority, application Luxembourg, Nov. 10, 1982, 84463

Int. Cl.[3] **C08G** *77/04*

U.S. Cl. 528—27 **13 Claims**

1. A polyquaternary polysiloxane polymer which comprises recurring units of the general formula:



(I)

in which:

A denotes a divalent α,ω-bis-(alkyl)-polysiloxane group or a linear or branched, saturated or unsaturated hydrocarbon chain containing up to 6 consecutive carbon atoms, optionally substituted by one or more hydroxyl groups and optionally one or more chain oxygen atoms and/or aromatic rings;

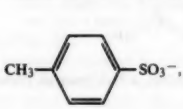
R_1, R_2, R_3 and R_4, which are identical or different, denote a C_1–C_6 alkyl radical or a phenyl radical;

R_5 denotes a methyl, ethyl or hydroxyethyl radical;

R_6 denotes a C_1–C_{18} alkyl radical or two adjacent radicals R_6 together with the nitrogen atom to which they are attached and the radical A therebetween form a divalent piperazino group;

or two adjacent radicals R_5 together with the two radicals R_6 attached to the same nitrogen atoms, the said nitrogen atoms and the radical A therebetween form a triethylenediamino radical, or R_5 and R_6 together denote a heterocycle with the nitrogen atom to which they are attached;

Y^- denotes an anion which is $Cl\ominus$, $Br\ominus$, $CH_3SO_3\ominus$ or



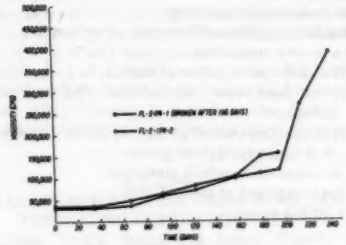
m denotes an integer from 1 to 6; and

p denotes a number from 1 to 50.

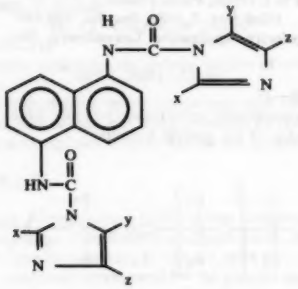
4,533,715
SINGLE PACKAGE EPOXY RESIN SYSTEM

Frank W. C. Lee, Dublin, and Kenneth S. Baron, San Ramon, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Sep. 7, 1983, Ser. No. 530,106
Int. Cl.³ C08G 18/81, 18/28
U.S. Cl. 528—45 12 Claims



1. A curing agent for epoxy resins having the formula



wherein x, y, and z may be the same or different, and each may be hydrogen, a lower alkyl or aryl of C_{1-12}, halo or nitro.

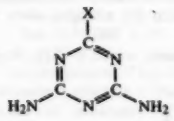
4,533,716
COATING RESIN COMPOSITION

Noboru Okoshi, Chiba, and Takenori Ikeda, Ichihara, both of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Aug. 3, 1984, Ser. No. 637,539
Claims priority, application Japan, Aug. 5, 1983, 58-142491
Int. Cl.³ C08G 18/38
U.S. Cl. 528—73 5 Claims

1. A coating resin composition consisting essentially of

(A) a triazine-type resin obtained by co-condensing a triazine-type amino compound represented by the general formula



wherein X is hydrogen, methyl, ethyl, propyl, phenyl or amino,

formaldehyde and a polyol and as required, a monohydric alcohol, and

(B) a polyisocyanate,

the solids weight ratio of (A) to (B) being from 5:95 to 95:5.

4,533,717
MODIFIED POLYURETHANE LIQUID POLYMER COMPOSITIONS

James M. O'Connor, Clinton; Donald L. Lickel, Cheshire; Michael L. Rosin, Madison, all of Conn., and Richard J. Donze, Stow, all of Ohio, assignors to Olin Corporation, Cheshire, Conn. and Morgan Construction Company, Worcester, Mass.

Continuation-in-part of Ser. No. 419,684, Sep. 20, 1982, abandoned, which is a division of Ser. No. 203,212, Nov. 3, 1980, abandoned. This application Jan. 16, 1984, Ser. No. 571,216
Int. Cl.³ C08G 18/48; B21C 1/14
U.S. Cl. 528—78 10 Claims

1. A process for preparing a polyurethane polymer product comprising mixing a urethane oligomer and a heat activated free radical generating catalyst, and then heating said mixture at a temperature adequate to activate said catalyst and cure said mixture, said urethane oligomer having a final free NCO content from 0% to about 20% and containing terminal reactive unsaturation and being prepared by reacting

(a) an isocyanate-terminated prepolymer having a final free NCO content ranging from about 0.5% to about 30% which is the product of reacting

(1) an organic polyisocyanate with

(2) a polyol having

(i) an average equivalent weight of about 75 to about 500,

(ii) an average functionality of at least about 3, with

(b) an isocyanate reactive group-containing unsaturated monomer selected from the group consisting of

(1) hydroxyalkyl acrylates,

(2) hydroxyalkyl methacrylates and

(3) hydroxyalkyl acrylamides.

4,533,718
OIL AND HIGH TEMPERATURE RESISTANT INSULATING VARNISH MADE FROM MODIFIED METHOXY-FUNCTIONAL DIPHENYL OXIDE

Louis A. Cargnel, Unity Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 10, 1984, Ser. No. 629,391
Int. Cl.³ C08G 77/04
U.S. Cl. 528—86 11 Claims

1. A heat curable, storage stable, high temperature resistant, resinous, liquid insulating varnish comprising a heat reacted admixture comprising:

(A) methoxy functional diphenyl oxide resinous material; and

(B) metal halide catalyst, present in the range of from about 0.01 wt.% to about 0.2 wt.% based on the weight of (A), in combination with silicon dioxide stabilizer having a particle size of up to about 10 microns, present in the range of from about 2 wt.% to about 10 wt.% based on the weight of (A), where the silicon dioxide interacts with the metal halide to hinder the catalytic activity of the metal halide during room temperature storage after varnish formation.

4,533,719
EPOXY RESINS WITH INCREASED FLEXIBILITY

Harold G. Waddill, Austin, Tex., assignor to Texaco, Inc., White Plains, N.Y.

Filed Mar. 22, 1984, Ser. No. 592,143
Int. Cl.³ C08G 59/54; C07G 103/50
U.S. Cl. 528—111 13 Claims

1. An epoxy resin composition having superior flexibility and being the cured reaction product of a curable admixture which comprises a vicinal polyepoxide and a curing amount of a monoamide prepared by the condensation of fatty monocarboxylic acids and polyoxyalkylene polyamides with an amine functionality of 3 or more.

4,533,720

POLYARYLATE FORMATION BY ESTER INTERCHANGE REACTION USING γ- GAMMA LACTONES AS DILUENT

Michael C. Yu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 13, 1983, Ser. No. 531,788
Int. Cl.[3] C08G 63/28
U.S. Cl. 528—125 37 Claims

1. The process of preparing a polyarylate by the process conducted in steps comprising:

(a) heating together under reaction conditions reagents comprising at least one bisphenol, at least one aromatic dicarboxylic acid, and at least one organic acid anhydride, together with at least one γ-lactone as diluent, up to a moderately elevated first temperature with an inert gas purge over a first time interval;

(b) maintaining substantially said first temperature for a second time interval;

(c) gradually elevating the temperature to a higher second temperature over a third time interval while maintaining a flow of inert gas;

thereby forming a prepolymer, and

(d) reducing the pressure gradually to vacuum conditions while maintaining said second temperature for a fourth time interval; and

(e) substantially maintaining the higher second temperature while maintaining said vacuum conditions for a fifth time interval;

thereby forming said polyarylate.

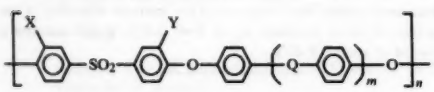
4,533,721

CHLORINE CONTAINING POLYETHER SULFONE POLYMERS AND PREPARATION THEREOF

Shigeru Kurosawa, Oita, and Takashi Ueshima, Sagamihara, both of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00406, § 371 Date Aug. 23, 1983, § 102(e) Date Aug. 23, 1983
PCT Filed Dec. 23, 1981, Ser. No. 531,890
Int. Cl.[3] C08G 81/06
U.S. Cl. 528—174 8 Claims

1. A substantially linear, chlorine-containing polyether-sulfone polymer consisting essentially of repeating units represented by the following general formula (I):



(I)

wherein X and Y stand for a hydrogen atom or a chlorine atom, with the proviso that at least one of X and Y is a chlorine atom, Q stands for a direct bond, —O—, —S— or a divalent aliphatic or alicyclic hydrocarbon group in which the carbon number is an integer of from 1 to 6, m is 0 or 1, and n is an integer of from 10 to 1000.

4,533,722

INTERFACIAL POLYCONDENSATION POLYCARBONATE PROCESS WITH QUATERNARY PHOSPHONIUM AMINO HALIDE CATALYST

John R. Campbell, Clifton Park, N.Y., and James W. Thackeray, Somerville, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,525
Int. Cl.[3] C08G 63/62
U.S. Cl. 528—199 5 Claims

1. In an interfacial polycondensation process for preparing a film forming polycarbonate comprising introducing a carbonyl halide reactant into a mixture while it is agitated comprising an organic phase of aromatic dihydroxy compound, inert organic solvent, a chain-stopper, and quaternary phosphonium polycondensation catalyst and an aqueous solution of an alkali metal hydroxide having a pH of at least 10, the improvement which comprises utilizing as the quaternary phosphonium polycondensation catalyst, a quaternary phosphonium amino halide, whereby a substantial reduction in carbonyl halide usage is achieved and the quaternary phosphonium amino halide polycondensation catalyst can be recycled.

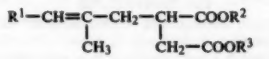
4,533,723

SEMI-ESTERS OF POLYISOBUTYLENESUCCINIC ACID, THEIR SYNTHESIS AND PREPARATIONS CONTAINING THESE COMPOUNDS WHICH CAN BE TRANSFORMED BY RADIATION INTO AN ADHESIVE

Christian Weitemeyer, Essen, Fed. Rep. of Germany, assignor to TH. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,712
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323913
Int. Cl.[3] C08G 63/52
U.S. Cl. 528—303 4 Claims

1. Semi-esters of polyisobutylenesuccinic acid having the formula



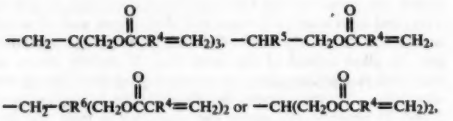
I

in which

R^1 is a polyisobutylene radical with a molecular weight of 100 to 20,000,

R^2 and

R^3 are different from one another and one of these two radicals is a hydrogen radical and the other one a group, selected from the group consisting of



in which

R^4 and R^5 are a hydrogen or methyl radical, and

R^6 is a methyl or ethyl radical.

4,533,724

LIQUID CRYSTALLINE POLY (2,6-BENZOTHIAZOLE) COMPOSITIONS, PROCESS, AND PRODUCTS

James F. Wolfe, Redwood City, Calif.; Paul D. Sybert, Joanne R. Sybert, both of Cohoes, N.Y., and Blake Wilson, Belmont, Calif., assignors to SRI International, Menlo Park, Calif.

PCT No. PCT/US82/01286, § 371 Date Sep. 17, 1982, § 102(e) Date Sep. 17, 1982, PCT Pub. No. WO84/01161, PCT Pub. Date Mar. 29, 1984
PCT Filed Sep. 17, 1982, Ser. No. 451,741
Int. Cl.[3] C08G 69/08, 73/10, 75/00, 79/02
U.S. Cl. 528—313 19 Claims

6. A process according to claim 5 wherein said phosphorus pentoxide content of said monomer reaction medium of step (c) is of an amount suitable for polymerization to provide a homopolymeric product of said polymerization reaction having a phosphorus pentoxide content between about 82% and about 86% by weight.

4,533,725

SYNTHESIS OF HIGH MOLECULAR WEIGHT POLYBENZIMIDAZOLE WITH ARYLHALO PHOSPHORUS COMPOUND CATALYST

Eui W. Choe, Randolph, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Delanese Corporation, New York, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,887
Int. Cl.³ C08G 73/18
U.S. Cl. 528—336 14 Claims

1. A two stage polymerization process for the production of high molecular weight polybenzimidazole from a mixture of (1) at least one aromatic tetraamine containing two groups of amine substituents, said amine substituents in each group being in an ortho position relative to each other, and (2) at least one dicarboxylate ester, which comprises heating the mixture above the melting temperature thereof in a first stage melt polymerization zone in contact with a halophosphorus polymerization catalyst selected from arylhalophosphines or arylhalophosphites to provide a foamed prepolymer; and heating the prepolymer in a second stage solid state polymerization zone at a temperature above about 250° C. to produce high molecular weight polybenzimidazole product.

4,533,726

POLYMERIC HYDROPHILE FROM CARBOXY TERMINATED LIQUID POLYMER, DIAMINE AND PHOSPHAZENE

Ronald E. Myers, Strongsville, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Filed Jul. 10, 1984, Ser. No. 629,376
Int. Cl.³ C08G 69/26
U.S. Cl. 528—336 10 Claims

1. A composition of matter comprising the reaction product of a carboxyl terminated reactive liquid polymer, a phosphazene, and a diamine, in the presence of a scavenger for elimination products, the reactive liquid polymer being of the form HOOCBCOOH wherein B is a backbone including at least one polymerized vinylidene monomer selected from a group consisting of (a) monoolefins having between 2 and 14 carbon atoms; (b) dienes having between 4 and 10 carbon atoms; (c) vinyl and allyl esters; (d) vinyl and allyl ethers; and (e) acrylates of the form CH_2=CH—COOR′, R′ being one of hydrogen, an alkyl radical of not more than 18 carbon atoms, an alkoxyalkyl, alkylthioalkyl, or cyanoalkyl radical having not more than 12 carbon atoms, the phosphazene having between 3 and 20 phosphorous atoms and including at least one carboxyl activating reactive substituent, the diamine being selected from among saturated or unsaturated, straight chained, cyclic, or acylic primary or secondary diamines having between about 3 and about 12 carbon atoms, the scavenger being selected from the group consisting of carbonates, bi carbonates and a tertiary amine having attached radicals selected from among saturated or unsaturated branched, straight chained, cyclic or acyl radicals having not more than about 6 carbon atoms.

4,533,727

PROCESS FOR PRODUCING A CURABLE RESIN FROM CYANATE ESTER COMPOUND AND UNSATURATED 1,2-EPOXY COMPOUND

Morio Gaku, Saitama; Hidenori Kimbara, Tokyo; Satoshi Ayano, and Susumu Yoshimura, both of Kanagawa, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Apr. 3, 1984, Ser. No. 596,086
Claims priority, application Japan, Apr. 6, 1983, 58-60291; Apr. 21, 1983, 58-70574; Apr. 21, 1983, 58-70575; Apr. 21, 1983, 58-70576
Int. Cl.³ C08G 83/00
U.S. Cl. 528—361 8 Claims

1. A process for producing a curable resin which comprises reacting (a) at least one cyanate ester compound selected from the group consisting of polyfunctional cyanate esters having 2 or more cyanate groups per one molecule, prepolymers of the cyanate esters or mixtures thereof with (b) at least one compound having at least one 1,2-epoxy group and at least one radical-polymerizable unsaturated double bond, the ratio of the cyanate group of (a) to the 1,2-epoxy group of (b) being in the range of about 1:0.25 to about 1:2, in contact with (c) a radical polymerization inhibitor at a temperature of about 140° C.

4,533,728

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT POLYESTER CARBONATES

Helmut Waniczek, Cologne; Walter Uerdingen, and Karola Brudermanns, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 11, 1984, Ser. No. 619,487
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322667
Int. Cl.³ C08G 63/62
U.S. Cl. 528—370 6 Claims

1. A process for the production of non-aromatic polyester carbonate which has an intrinsic viscosity of from 0.9 to 2.5 dl/g, measured in a solution of tetrahydrofuran at 25° C., from (a) polyesterdiol produced from a dicarboxylic acid and a diol having a number average molecular weight $\overline{M}_n$ of from 800 to 3,500, (b) polyetherdiol having a number average molecular weight $\overline{M}_n$ of from 250 to 3,500 and (c) diarylcarbonate, characterized in that in a first stage

(a) from 30 to 100%, by weight, based on the sum of a+b, of polyesterdiol,

(b) from 70 to 0%, by weight, based on the sum of a+b, of polyetherdiol and

(c) from 0.95 to 1.2 moles of diarylcarbonate per mol of (a+b) are heated in contact with

(d) from 50 to 500 ppm, based on the sum of a+b+c, of a transesterification catalyst

at 100° to 200° C. under a pressure of less than 140 mbars while the resulting hydroxyl compounds are removed, until the reaction product has an intrinsic viscosity of from 0.6 to 1.1 dl/g; from 0.1 to 10%, by weight, based on the sum of a+b+c, of phenol (e) is added; and component (e) is removed in a second stage at from 100° to 200° C. and under a pressure of from 3 to 260 mbars, and the temperature and pressure are maintained within these limits until the intrinsic viscosity of the reaction product increases by at least 0.1 dl/g and reaches a value of at least 0.9 dl/g.

4,533,729

PROCESS FOR THE PREPARATION OF POLYCARBONATE POLYOLS

Gordon C. Newland, Kingsport, Tenn., and William R. Darnell, Weber City, Va., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,396
Int. Cl.³ C08G 63/62
U.S. Cl. 528—371 20 Claims

1. A process for preparing amorphous polycarbonate polyols comprising the steps of:

(A) reacting (i) phosgene, (ii) a branched-chain polyhydric alcohol having about 4 to 12 carbon atoms, and (iii) about 3 to 40 mole percent, based upon the total amount of polyhydric alcohol, of a straight chain polyhydric alcohol having about 5 to 20 carbon atoms in the presence of a solvent and in the absence of a catalyst at a temperature of about 60° to 100° C., and

(B) contacting the amorphous polycarbonate product in the reaction mixture with a catalytic amount of a tertiary amine at reflux temperature for a period of time of at least about 30 minutes.

4,533,730
1-OXADETHIACEPHAM COMPOUNDS

Mitsuru Yoshioka; Uyeo Shoichiro, both of Toyonaka; Yoshio Hamashima, Kyoto; Ikuo Kikkawa, Takarazuka; Teruji Tsuji, Takatsuki, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 374,862, May 4, 1982, Pat. No. 4,443,598, which is a continuation-in-part of Ser. No. 322,662, Nov. 18, 1981, Pat. No. 4,366,316, which is a continuation of Ser. No. 72,600, Sep. 5, 1979, abandoned, which is a continuation of Ser. No. 877,811, Feb. 14, 1978, abandoned. This application Oct. 19, 1983, Ser. No. 543,940

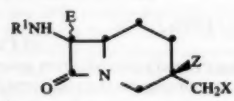
Claims priority, application Japan, Feb. 15, 1977, 52-15813; Jun. 6, 1977, 52-67025; Oct. 1, 1980, 55-138092

The portion of the term of this patent subsequent to Apr. 17, 2001, has been disclaimed.

Int. Cl.³ C07D *498/04*

U.S. Cl. 544—92 6 Claims

1. A compound of the formula



COB

wherein

R^1 is

(1) C_1 to C_{10} alkanoyl,

(2) C_1 to C_7 haloalkanoyl,

(3) azidoacetyl, cyanoacetyl, trifluoromethylthioacetyl, cyanomethylthioacetyl, or (4-pyridon-1-yl)acetyl;

(4) acyl group of the following formula

Ar—CO—

wherein Ar is an aryl selected from furyl, thienyl, pyrrolyl, oxazolyl, isoxazolyl, oxadiazolyl, oxatriazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thiatriazolyl, pyrazolyl, imidazolyl, triazolyl, tetrazolyl, phenyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, triazinyl, dihydrophenyl, tetrahydrophenyl, tetrahydropyrimidyl, naphthyl, benzothiazolyl, indolyl, quinolyl, isoquinolyl, benzopyrimidyl, cinnolinyl, pyridopyrimidyl, or indanyl ring group;

(5) group of the following formula:

Ar—CQQ′—CO—

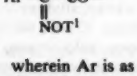
wherein Ar is as defined above and Q and Q′ each is hydrogen or methyl;

(6) acyl group of the following formula:

Ar—G—CQQ′—CO—

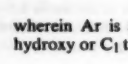
wherein Ar, Q and Q′ each is as defined above and G is oxygen, sulfur, or imino;

(7) acyl group of the following formula

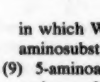


wherein Ar is as defined above and T^1 is hydrogen or C_1 to C_6 alkyl;

(8) acyl group of the following formula:



wherein Ar is as defined above and T^2 is one of (i) hydroxy or C_1 to C_{10} acyloxy, (ii) carboxy or protected carboxy, (iii) sulfo or C_1 to C_5 alkoxysulfonyl, or a group of the formula:



in which W^1 and W^2 each is hydrogen or a C_1 to C_{15} aminosubstituent;

(9) 5-aminoadipoyl, 5-aminoadipoyl protected at the amino or 5-aminoadipoyl protected at the carboxy;

(10) acyl group of the following formula:

L—O—CO—

wherein L is an easily removable and unsubstituted or substituted C_1 to C_{10} hydrocarbyl group; or

(11) C_1 to C_{20} optionally substituted hydrocarbyl, C_3 to C_{10} organic silyl, or C_1 to C_{10} sulfenyl,

COB is carboxy or protected carboxy, the carboxy protecting group B in said COB being C_1 to C_{10} alkoxy, C_1 to C_6 haloalkoxy, C_3 to C_{10} acylalkoxy, C_3 to C_{10} alkoxyalkoxy, C_2 to C_{10} aminoalkoxy, aryloxy, aralkoxy, C_1 to C_{10} alkylsilyloxy, C_1 to C_{10} alkylstannyloxy, C_1 to C_{10} acyloxy, inorganic acyloxy, metal oxy of a group I, II or III metal in the periodical table, C_1 to C_{15} hydrocarbylammonioxy, C_1 to C_{10} hydrocarbylthio or mercapto, C_1 to C_5 alkylamino, di-C_1 to C_5 alkylamino, hydrazinyl or azido;

E is β-hydrogen or α-methoxy;

X is hydrogen, halogen, hydroxy, C_1 to C_4 alkanoyloxy, substituted C_1 to C_4 alkanoyloxy, aroyloxy, carbonic acyloxy, C_1 to C_6 alkoxy, aralkoxy of the formula Ar—CH_2O— or aryloxy of the formula Ar—O— in which Ar is as defined above, mercapto, C_1 to C_5 alkanoylthio, aroylthio, C_1 to C_6-alkylthio, aralkylthio, arylthio of the formula Ar—S— in which Ar is as defined above, amino, azido, hydrazinyl, acetylamino, methylamino, pyridinium, picolinium, 4-carboxypyridinium, carbamoylpyridinium, hydroxymethylpyridinium, carboxymethylpyridinium, or chloropyridinium, and

Z is a group of the formula

$RS(O)_n$— or $RSe(O)_n$—

in which R is C_1 to C_3 alkyl or monocyclic aryl and n is 0, 1 or 2.

4,533,731
AMINOINDAZOLE DERIVATIVES

Tadayuki Ibuki; Taisuke Sugihara; Hiromu Kawakubo, and Takanori Sone, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

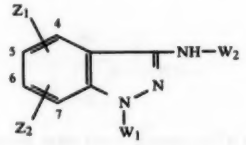
Filed Mar. 16, 1983, Ser. No. 475,945

Claims priority, application Japan, Mar. 17, 1982, 57-40686; Mar. 17, 1982, 57-40687; Mar. 17, 1982, 57-40688; Mar. 17, 1982, 57-40689; Mar. 17, 1982, 57-40690; Mar. 17, 1982, 57-40691; Mar. 17, 1982, 57-40692

Int. Cl.³ C07D *231/56, 413/06*

U.S. Cl. 544—140 8 Claims

1. A compound of the formula (I):



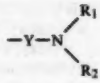
(I)

wherein

W_1 is a

group wherein Y is a n-C_{1-6} alkylene group or a n-C_{1-6} alkylene group having a C_{1-6} alkyl group substituent; and R_1 and R_2 each independently is a hydrogen atom or a C_{1-6} alkyl group, and the

group in the



group may form a saturated heterocyclic ring selected from the group consisting of morpholino, pyrrolidino, piperidino, homopiperidino and piperazino groups, and the saturated heterocyclic ring except the morpholino group may have at least one C_{1-4} alkyl group, hydroxyl group or halogen atom as a substituent;

W_2 is a hydrogen atom;

Z_1 is a hydroxyl group;

Z_2 is a hydrogen atom; and the physiologically acceptable acid addition salt thereof.

4,533,732

3-PROPIONYLSALICYLIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION OF THE SAME

Hiroshige Inoue, Osaka; Kenichi Fukushima, Arita, and Ikuzo Nishiguchi, Hirakata, all of Japan, assignors to Yamamoto Chemical Industrial Company, Limited, Wakayama and Osaka Municipal Government, Osaka, both of, Japan

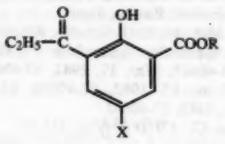
Filed Sep. 30, 1983, Ser. No. 538,016

Claims priority, application Japan, Sep. 30, 1982, 57-171304

Int. Cl.³ C07D *295/14*; C07C *65/10, 69/88*

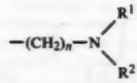
U.S. Cl. 544—172 **11 Claims**

1. A derivative of 3-propionylsalicylic acid represented by the formula (I)

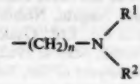


(I)

wherein R represents a hydrogen atom, a lower alkyl group or a group



(wherein R^1 and R^2 represent a lower alkyl group or R^1 and R^2, when taken together with the nitrogen atom to which they are attached, may form a heterocyclic ring with or without an intervening hetero atom, and n is an integer of 1 to 4), and X represents a hydrogen atom or a halogen atom, R being the group



when X is a hydrogen atom.

4,533,733

PROCESS FOR OBTAINING CYANURIC CHLORIDE IN SOLID OR LIQUID FORM

Heinz-Rüdiger Vollbrecht, Stein, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 636,334

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336994

Int. Cl.³ C07D *251/28*

U.S. Cl. 544—190 **10 Claims**

1. Process for recovering cyanuric chloride from cyanuric chloride containing vapor, comprising the steps of diluting the cyanuric chloride containing vapor, with a hot air stream having a temperature of from 60° to 140° C., and

introducing the diluted vapor into the lower part of a separation chamber cooled to a temperature of from 20° to 50° C. to precipitate the cyanuric chloride from the vapor.

4,533,734

INOTROPIC AGENTS

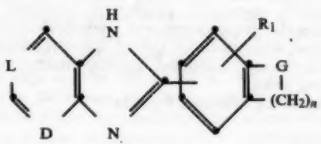
David W. Robertson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 10, 1983, Ser. No. 550,332

Int. Cl.³ A61K *31/44*

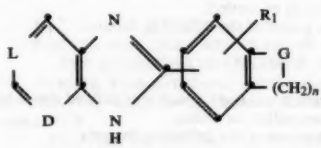
U.S. Cl. 514—303 **20 Claims**

1. Compounds of the formulas



I

and



Ia

and their pharmaceutically acceptable salts, wherein:

R_1 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, allyloxy, propargyloxy, benzyloxy, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)sulfinyl, (C_1–C_4 alkyl)sulfonyl, hydroxy, halo, cyano, nitro, amino, mono- or di-(C_1–C_4 alkyl)amino, trifluoromethyl or Z-Q-substituted C_1–C_4 alkoxy, wherein Q is oxygen, sulfur, sulfinyl, sulfonyl, or a bond, and Z is C_1–C_4 alkyl, phenyl or phenyl substituted with halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, nitro, amino, (C_1–C_4 alkyl)thio, (C_1–C_4 alkyl)sulfinyl, or (C_1–C_4 alkyl)sulfonyl;

Each of L and D is independently N or CH with the proviso that L and D may not both be CH at the same time;

G is $—CH_2—$, $—NR_2—$, —O—, or $—S(O)_r—$, where R_2 is C_1–C_3 alkyl, and r is 0, 1, or 2; and n is 2 or 3.

4,533,735

PROCESS FOR PREPARING ANTIBACTERIAL COMPOUNDS

Thomas J. Walter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 300,046, Sep. 8, 1981, Pat. No. 4,405,792. This application May 19, 1983, Ser. No. 495,977

Int. Cl.³ C07D *215/16*

U.S. Cl. 546—156 **9 Claims**

1. The process wherein:

(a) a 4-(4-halophenyl)pyridine is nitrated to a 4-(4-halo-3-nitrophenyl)pyridine,

(b) the 4-(4-halo-3-nitrophenyl)pyridine is reduced to a 4-(3-aminophenyl)pyridine,

(c) the 4-(3-aminophenyl)pyridine is reacted with a dialkyl ethoxymethylenemalonate to form a dialkyl 3-(4-pyridyl-)anilinomethylenemalonate,

(d) the dialkyl 3-(4-pyridyl)anilinomethylenemalonate is cyclized to an alkyl 1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate,

(e) the alkyl 1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate is N-alkylated to an alkyl 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate, and

(f) the alkyl 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate is hydrolyzed to a 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylic acid.

4. The process wherein:

(a) a 4-(4-halophenyl)pyridine is nitrated to a 4-(4-halo-3-nitrophenyl)pyridine,

(b) the 4-(4-halo-3-nitrophenyl)pyridine is reduced to a 4-(3-aminophenyl)pyridine,

(c) the 4-(3-aminophenyl)pyridine is converted to a 3-(4-pyridyl)-N-alkylaniline,

(d) the 3-(4-pyridyl)-N-alkylaniline is reacted with a dialkyl ethoxymethylenemalonate to form a dialkyl 3-(4-pyridyl)-N-alkylanilinomethylenemalonate,

(e) the dialkyl 3-(4-pyridyl)-N-alkylanilinomethylenemalonate is cyclized to an alkyl 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate, and

(f) the alkyl 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylate is hydrolyzed to a 1-alkyl-1,4-dihydro-4-oxo-7-(4-pyridyl)-3-quinolinecarboxylic acid.

4,533,736

PROCESS FOR THE PREVENTION OR REDUCTION OF DISCOLORATION OF SODIUM PYRITHIONE

Samuel I. Trotz, Orange, and Douglas A. Farmer, Jr., Madison, both of Conn., assignors to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 352,813, Feb. 26, 1982, Pat. No. 4,482,715. This application Jul. 2, 1984, Ser. No. 626,951

Int. Cl.³ A61K *31/44;* **C07D** *213/89*

U.S. Cl. 546—290 **6 Claims**

1. A process for preventing or reducing discoloration of aqueous sodium pyrithione solutions comprising

treating a sodium pyrithione solution with an effective amount of a selected reducing agent to prevent or reduce the discoloration, said reducing agent selected from the class consisting of alkali metal sulfites, alkali metal bisulfites, hydrazine, and mixtures thereof.

4,533,737

SILICON FUNCTIONALIZED NORBORNANE CARBOXYIMIDE AND METHODS FOR MAKING

Hong-Son Ryang, Camarillo, Calif., assignor to General Electric Company, Schenectady, N.Y.

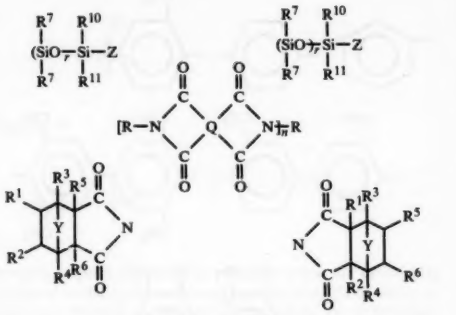
Filed Apr. 2, 1984, Ser. No. 596,187

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

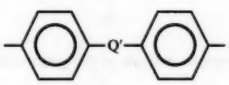
Int. Cl.³ C07F *7/10*

U.S. Cl. 548—110 **8 Claims**

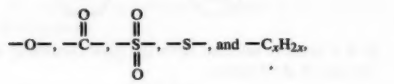
1. Silicon functionalized norbornane carboxyimides of the formula,



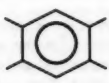
where R is a divalent radical selected from the class consisting of (a) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated aromatic hydrocarbon radicals having from 6–20 carbon atoms, (b) alkylene radicals having from 2–20 carbon atoms and cycloalkylene radicals having from 2–20 carbon atoms, (c) $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (d) radicals included by the general formula,



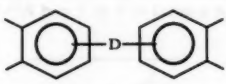
Q′ is a member selected from the class consisting of



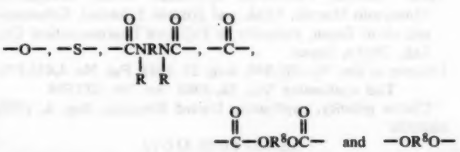
x is a whole number from 1 to 5 inclusive, Q is a tetravalent radical selected from



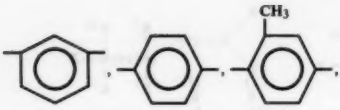
and

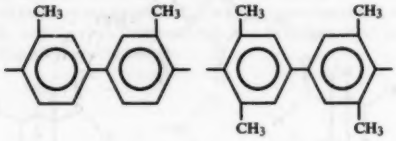


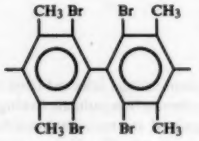
where D is a member selected from

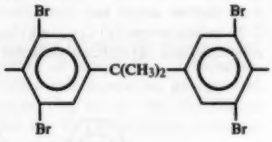


and R^8 is a divalent radical selected from

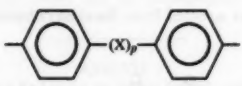




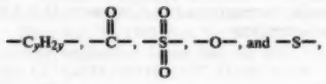




and divalent organic radicals of the general formula,



X is a member selected from the class consisting of divalent radicals of the formula,



y is an integer from 1 to 5, R^1-R^6 are selected from hydrogen and $C_{(1-8)}$ alkyl radicals, R^7 is the same or different $C_{(1-13)}$ monovalent hydrocarbon radical and substituted $C_{(1-13)}$ monovalent hydrocarbon radical, Y is a divalent radical selected from —O— and $-C(R^1)_2-$, Z is selected from $C_{(1-8)}$ alkoxy, acyloxy, halogen and amine, n is an integer equal to 0–200 inclusive, and p is equal to 0 or 1, and R^{10}-R^{11} are selected from Z or R^7.

4,533,738

NEW CEPHEM COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takao Takaya, Kawanishi; Yoshikazu Inoue, Amagasaki; Masayoshi Murata, Mino, and Hisashi Takasugi, Kohamanishi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

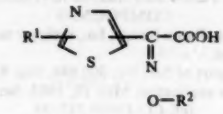
Division of Ser. No. 296,860, Aug. 27, 1981, Pat. No. 4,416,879. This application Aug. 16, 1983, Ser. No. 523,594

Claims priority, application United Kingdom, Sep. 8, 1980, 8028933

Int. Cl.³ C07D *417/12*

U.S. Cl. 548—194 **6 Claims**

1. A compound of the formula



wherein R^1 is amino or a protected amino group; and

R^2 is a saturated 4 to 8-membered heteromonocyclic group containing one sulfur atom selected from the group consisting of thietanyl, thiolanyl, thianyl, thiepanyl and thiocanyl, and a salt thereof.

4,533,739

2-[(AMINOPHENYL AND AMIDOPHENYL)AMINO]-1-AZACYCLOALKANES HAVING ANTIDIARRHEAL ACTIVITY

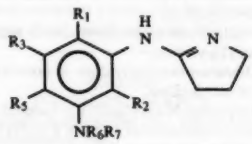
Barnett S. Pitzele, Skokie; Stella S. T. Yu, Morton Grove; Robert W. Hamilton, Wilmette, and Alan E. Moormann, Skokie, all of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Oct. 12, 1982, Ser. No. 433,922

Int. Cl.³ C07D *207/18*

U.S. Cl. 548—559 **4 Claims**

1. A compound of the formula:



wherein R_1, R_2, R_3, and R_5, each being the same or different, are:

(a) hydrogen;

(b) alkyl of 1 to 6 carbon atoms, inclusive; or

(c) halogen;

with the proviso that R_1 and R_2 are not hydrogen at the same time;

wherein R_6 and R_7, each being the same or different, are:

(a) hydrogen;

(b) alkyl of 1 to 6 carbon atoms, inclusive;

(c) alkoxycarbonyl of 2 to 7 carbon atoms, inclusive;

(d) aryloxycarbonyl of 6 to 12 carbon atoms, inclusive;

(e) alkylcarbonyl of 2 to 7 carbon atoms, inclusive;

(f) arylcarbonyl of 6 to 12 carbon atoms, inclusive;

(g) hydroxyalkoxycarbonyl of 3 to 7 carbon atoms, inclusive;

(h) haloalkylcarbonyl of 2 to 7 carbon atoms, inclusive; or the pharmaceutically acceptable salts; the compound being either hydrated or unhydrated

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4,533,740

β-LACTONE PROCESS

P. K. Wong, Katy, and Mark K. Dickson, Houston, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 14, 1984, Ser. No. 609,604

Int. Cl.³ C07D *305/14, 305/12*

U.S. Cl. 549—328 **2 Claims**

1. A process for converting an olefin selected from the group consisting of norbornene and isobutylene to the corresponding beta-lactone which comprises:

(a) reacting the olefin with bis(organonitrile)chloro-nitropalladium (II) in an organic aprotic solvent to form a metallocycle and

(b) reacting the metallocycle with carbon monoxide in an organic aprotic solvent tc produce the beta-lactone.

4,533,741

4,5-DICHLORO-2,2,4,5,-TETRAFLUORO-1,3-DIOXOLANE

Edward N. Squire, Glen Mills, Pa., assignor to E. I. Dupont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 421,824, Sep. 23, 1982, Pat. No. 4,485,250. This application Oct. 9, 1984, Ser. No. 658,666

Int. Cl.³ C07D *13/04*

U.S. Cl. 549—455 **1 Claim**

1. 4,5-Dichloro-2,2,4,5-tetrafluoro-1,3-dioxolane.

4,533,742

PREPARATION OF 2-HYDROXYTETRAHYDROFURAN BY HYDROFORMYLATION OF ALLYL ALCOHOL USING KETONE SOLVENTS

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,509

Int. Cl.³ C07D *307/20*

U.S. Cl. 549—475 **11 Claims**

1. A process for preparing 2-hydroxytetrahydrofuran which comprises hydroformylating allyl alcohol by reaction with carbon monoxide and hydrogen in the presence of a rhodium carbonyl catalyst and a ketone solvent.

4,533,743

FURFURAL PROCESS

David J. Medeiros, Concord, and Mark B. Burnett, Moraga, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 16, 1983, Ser. No. 562,123

Int. Cl.³ C07D *307/50*

U.S. Cl. 549—489 **13 Claims**

1. A process for the production of furfural from pentosans comprising feeding an aqueous pentose solution containing 1 to 10 weight percent of pentoses into a plug flow reactor, feeding sufficient mineral acid into said plug flow reactor to make the acid normality of the water fed to the reactor to be between 0.05 and 0.2, operating said reactor in a manner such that the temperature of said reactor is between 220° C. and 300° C. and the residence times of said pentose is between 0.5 and 100 seconds and in a manner such that the concentration of pentose decreases progressively through the reactor and all fluid elements of said aqueous solution passing through said reactor have essentially the same residence times, and flowing an aqueous solution containing furfural from said plug flow reactor.

4,533,744

HYDROSILYLATION METHOD, CATALYST AND METHOD FOR MAKING

Robert E. Williams, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

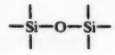
Division of Ser. No. 527,538, Aug. 29, 1983, Pat. No. 4,503,160. This application Nov. 13, 1984, Ser. No. 670,250

Int. Cl.³ C07F *7/08, 7/18*

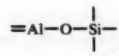
U.S. Cl. 556—479 **6 Claims**

1. A hydrosilylation method which comprises effecting contact between a silicon hydride and an aliphatically unsaturated organic material in the presence of an effective amount of a platinum catalyst comprising a hydroxylated oxide of silicon or aluminum having a surface area of about 100 to 800 square meters per gram and 0.05% to 5% by weight of chemically combined platinum atoms, which hydroxylated oxide of silicon or aluminum is derivatized with a plurality of

groups attached to the surface hydroxylated oxide of silicon or aluminum by



linkages, or



linkages, respectively, and the platinum atoms are chemically combined to the surface of the hydroxylated oxide of silicon or aluminum through the derivatized groups by Pt—S linkages.

4,533,745

AMINO KETONES AND THEIR PREPARATION

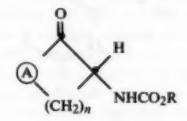
David E. McClure, Lansdale, Pa., assignor to Merck & Co., inc., Rahway, N.J.

Filed Dec. 8, 1980, Ser. No. 213,980

Int. Cl.³ C07C *105/06*

U.S. Cl. 560—28 **2 Claims**

1. A compound having the formula



wherein A is phenyl or substituted phenyl group, n is 1-3 and R is C_1–C_6 alkyl.

4,533,746

2-METHOXY-4-(2-METHYLPROPENYL) PHENYL ESTER OF ISOBUTYRIC ACID, FLAVOR USE THEREOF AND PROCESS FOR PREPARING SAME

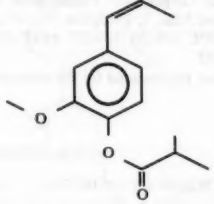
Richard A. Wilson, Westfield; Michael J. Zampino, North Bergen; David R. Bowen, Red Bank, and Domenick Luccarelli, Jr., Neptune, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 505,411, May 16, 1983, Pat. No. 4,473,588. This application Jun. 22, 1984, Ser. No. 623,460

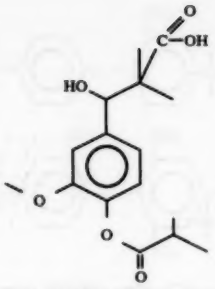
Int. Cl.³ C07C *67/08, 69/035*

U.S. Cl. 560—144 **2 Claims**

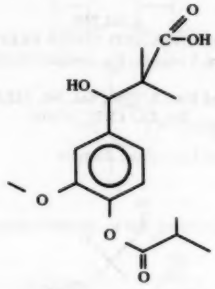
1. The process for preparing the compound having the structure:



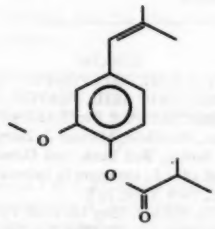
comprising the step of reacting isobutyric anhydride with vanillin thereby yielding a compound having the structure:



and then decarboxylating the compound having the structure:



to yield the compound having the structure:



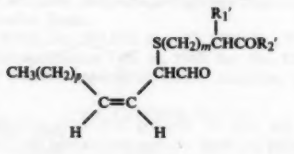
4,533,747

LEUKOTRIENE ANTAGONISTS INTERMEDIATES

John G. Gleason, Delran; Ralph F. Hall, Robbinsville, both of N.J., and Thomas W. Ku, Dresher, Pa., assignors to Smith-Kline Beckman Corporation, Philadelphia, Pa.

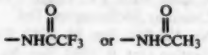
Filed Mar. 7, 1983, Ser. No. 472,772
Int. Cl.³ C07C *149/20, 149/23;* A61K *31/16, 31/185*
U.S. Cl. 560—152 **3 Claims**

1. A compound represented by the structural formula (I)

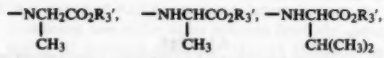


(I)

wherein m is 0, 1 or 2; p is 9, 10, 11, 12 or 13; R_1' is hydrogen,



and R_2' is amino, $-NHCH_2CO_2R_3'$,



$-NHCH_2CONH_2$ or $-OR_3'$ wherein R_3' is an alkyl radical containing one to six carbon atoms with the proviso that when m is 0, R_1' is hydrogen.

4,533,748

PROCESS FOR THE OPTICAL RESOLUTION OF THE DL-α-HYDROXY-3-(4-METHOXYPHENYL)-3-(2-AMINOPHENYLTHIO)PROPIONIC ACID

Elso Manghisi, and Giuseppe Cascio, both of Monza, Italy, assignors to Istituto Luso Farmaco D'Italia s.p.a., Milan, Italy

Filed Oct. 7, 1983, Ser. No. 539,840
Claims priority, application Italy, Oct. 15, 1982, 23769 A/82
Int. Cl.³ C07D *281/02;* C07C *149/20*
U.S. Cl. 562—401 **4 Claims**

1. A process for the preparation of the d- or l-isomer of the α-2-hydroxy-3-(4-methoxyphenyl)-3-(2-aminophenylthio)propionic acid having formula I, through optical resolution of the dl racemic compound, characterized in that the dl-α racemic compound is satisfied with L-lysine, the two optically active salts are separated by fractional crystallization and the corresponding optically active acids are obtained by treatment with diluted organic or inorganic acids.

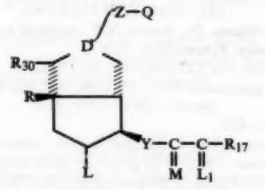
4,533,749

9-SUBSTITUTED CARBACYCLIN ANALOGS

Paul A. Aristoff, Portage, and John C. Sih, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 16, 1982, Ser. No. 349,122
Int. Cl.³ C07C *177/00, 57/26*
U.S. Cl. 562—501 **9 Claims**

1. A compound of the formula



wherein R is C_1–C_4 alkyl; R_{30} is hydrogen or R_{30} and R taken together form a methylene moiety;

wherein D is cis>C=C(R_3)—, trans>C=C(R_3)— or >$CHCH_2$, wherein R_3 is hydrogen or fluoro; wherein Z is:

(1) $—CH_2—(CH_2)_f—C(R_4)_2—$ wherein each R_4 is the same and is hydrogen or fluoro, and f is zero, one, 2 or 3;

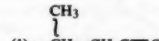
(2) trans—CH_2—CH=CH—; or

(3) $—(PH)—(CH_2)_g—$ wherein Ph is 1,2—, 1,3—, or 1,4-phenylene and g is zero, one, 2 or 3; with the proviso that when Z is $—(Ph)—(CH_2)_g—$, R_3 is hydrogen;

wherein Q is

(1) —$COOR_5$, wherein R_5 is
(a) hydrogen,
(b) (C_1–C_{12})alkyl,
(c) (C_3–C_{10})cycloalkyl,
(d) (C_7–C_{12})aralkyl,
(e) phenyl optionally substituted with one, 2 or 3 chloro or (C_1–C_4)alkyl,
(f) phenyl substituted in the para-position with —NH-COR_6, —COR_7, —OC(O)R_8 or —CH=N—NH-$CONH_2$, wherein R_6 is methyl, phenyl, acet-Damidophenyl, benzamidophenyl or —NH_2; R_7 is methyl, phenyl, —NH_2, or methoxy; and R_8 is phenyl or acetamidophenyl;
(g) phthalidyl,
(h) 3-(5,5-dimethyl-1,3,2-dioxaphosphorinan-2-yl)-2-oxo-propan-1-yl P-oxide,
(i) 3-(5,5-di(hydroxymethyl)-1,3,2-dioxaphosphorinan-2-yl)-2-oxopropan-1-yl P-oxide, or
(j) a pharmacologically acceptable cation;
(2) —CH_2OH;
(3) —COL_2, wherein L_2 is
(a) an amino group of the formula —NR_9R_{10} wherein R_9 is hydrogen or (C_1—C_{12})alkyl and R_{10} is
(i)hydrogen
(ii) (C_1–C_{12})alkyl
(iii) (C_3–C_{10})cycloalkyl,
(iv) (C_7–C_{12})aralkyl
(v) phenyl optionally substituted with one, 2 or 3 chloro, (C_1–C_3)alkyl, hydroxy, carboxy, (C_2–C_5)alkoxycarbonyl, or nitro,
(vi) (C_2–C_5)carboxyalkyl,
(vii) (C_2–C_5)carbamoylalkyl,
(viii) (C_2–C_5)cyanoalkyl,
(ix) (C_3–C_6)acetylalkyl,
(x) (C_7–C_{12})benzoalkyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, (C_1–C_3)alkoxy, carboxy, (C_2–C_5)-alkoxycarbonyl, or nitro,
(ix) pyridyl, optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy,
(xii) (C_6–C_9)pyridylalkyl optionally substituted by one, 2, or 3 chloro, (C_1–C_3)alkyl, hydroxy, or (C_1–C_3)alkyl,
(xiii) (C_1–C_4)hydroxyalkyl,
(xiv) (C_1–C_4)dihydroxyalkyl,
(xv) (C_1–C_4)trihydroxyalkyl;
(b) cycloamine selected from the group consisting of pyrolidino, piperidino, morpholino, piperazino, hexamethyleneimino, pyrroline, or 3,4-didehydropiperidinyl optionally substituted by one or 2 (C_1–C_{12})alkyl;
(c) carbonylamino of the formula —$NR_{11}COR_{10}$, wherein R_{11} is hydrogen or (C_1–C_4)alkyl and R_{10} is other than hydrogen, but otherwise defined as above;
(d) sulfonylamino of the formula —$NR_{11}SO_2R_{10}$, wherein R_{11} and R_{10} are defined in (c);
(4) —$CH_2NL_3L_4$, wherein L_3 and L_4 are hydrogen or (C_1–C_4)alkyl, being the same or different, or the pharmacologically acceptable acid addition salts thereof when Q is —$CH_2NL_3L_4$; or
(5) —CN;
wherein L is H,H; α—OR_{12},β—H; αH,β—OR_{12}; α—CH_2OR_{12},β—H; α—H,β—CH_2OR_{12} wherein R_{12} is hydrogen or a hydroxyl protective group;
wherein Y is trans —CH=CH—, cis—CH=CH—, —CH_2CH_2—, or —C≡C—;
wherein M is α—OR_{12},β—R_{14}; or α—R_{14}, β—OR_{12}, wherein R_{12} is as defined above, and R_{14} is hydrogen or methyl;
wherein L_1 is α—R_{15},β—R_{16}; α—R_{16},β—R_{15}; or a mixture thereof wherein R_{15} and R_{16} are hydrogen, methyl, or fluoro being the same or different with the proviso that one of R_{15} and R_{16} is fluoro only when the other of R_{15} and R_{16} is hydrogen or fluoro; wherein

taken together is



(1) —CH(CH$_3$)—CH_2C≡C—CH_3, or

(2) —C≡C—$C_qH_{2q}CH_3$ where q is an integer of from 2 to 6, and individual optical isomers thereof.

4,533,750

PROCESS FOR ISOLATING METHACRYLIC ACID BY EXTRACTION

Hiroshi Matsumura; Masato Otani, and Fumiki Murakami, all of Otake, Japan, assignors to Mitsubishi Rayon Co. Ltd., Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 169,808
Claims priority, application Japan, Jul. 19, 1979, 54-91991
Int. Cl.[3] C07C *51/48, 57/05, 57/055*
U.S. Cl. 562—600 **4 Claims**

1. A process for isolating methacrylic acid by solvent extraction from an aqueous methacrylic acid solution obtained from a gas phase catalytic oxidation reaction, which comprises:
contacting and mixing the said aqueous methacrylic acid solution with an extraction solvent precipitating and removing polymeric material from said mixture, decanting said mixture from which polymeric material has been removed, to form an organic phase and an aqueous solution, extracting methacrylic acid from said latter aqueous solution with an extraction solvent in an extraction column, removing a solvent phase from said extraction column, and recovering the methacrylic acid from said solvent.

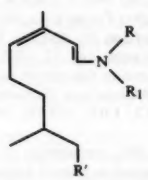
4,533,751

PREPARATION OF 1,3-DIENAMINES FROM MYRCENE AND SUBSTITUTED MYRCENE

Leon Cherney; Charles R. Gorman, both of Orange Park; Sean G. Traynor, and Carlos G. Cardenas, both of Jacksonville, all of Fla., assignors to SCM Corporation, New York, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,051
Int. Cl.[3] C07C *85/18*
U.S. Cl. 564—408 **14 Claims**

1. A process for preparing a 1,3-dienamine having the general formula:



wherein —R and —R_1 are independently selected from methyl, ethyl, n-propyl, isopropyl, n-butyl, sec.-butyl, tert.-butyl, amyl, and —R—R_1—, and R′ is selected from hydrogen and C_1–C_{10} alkyl and alkenyl groups, by reacting in the liquid phase a polyene hydrocarbon having the general formula:

wherein R' is as defined above with a secondary amine selected from dialkyl amines or alkylene cyclic secondary amines wherein the alkyl or alkylene group contains from 1 to 5 carbon atoms, at a temperature in the range of from −20° C. to 150° C. and in the presence of a catalytic amount of the corresponding alkali metal amide ion of said secondary amine for a period of time between about 20 minutes and about 50 hours effective to produce said dienamine, the mole ratio of said secondary amine to said polyene being greater than 1:1 and up to about 10:1, and recovering the dienamine from the reaction mass.

4,533,752

PROCESS FOR REDUCING AROMATIC COMPOUNDS IN ETHYLENEDIAMINE WITH CALCIUM

Robert A. Benkeser, West Lafayette, Ind.; James A. Laugal, Lostant, Ill., and Angela Rappa, Baltimore, Md., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 23, 1984, Ser. No. 643,442

Int. Cl.³ C07C *5/10*

U.S. Cl. 564—428 **18 Claims**

1. A method for reducing an organic compound having at least one benzene ring and obtaining therefrom a cyclic olefin having the same structure as such organic compound except for degree of unsaturation, which comprises contacting such organic compound with a reaction mixture comprising ethylenediamine and calcium metal at a temperature between about −10° C. and about 100° C., for a period of time sufficient to effect the said reduction, the proportion of calcium metal to such organic compound being at least about 10% in excess of the stoiohiometric quantity necessary for complete reduction of such benzene ring, the said reaction medium also including, when the excess of calcium is less than 100%, an inert abrasive particulate substance, whereby a cyclic olefin is obtained having at least one double bond and having a second double bond when the benzene ring bears a substituent hindering the said reduction.

4,533,753

(HYDROCARBYLTHIO)PHENOLS AND THEIR PREPARATION

Bonnie G. McKinnie, and Paul F. Ranken, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 430,553, Sep. 30, 1982, now Re. 31,771. This application Apr. 12, 1983, Ser. No. 484,338

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.³ C07C *148/00, 149/36*

U.S. Cl. 568—47 **24 Claims**

1. A process for the preparation of substituted phenols which comprises reacting a phenol having at least two positions available for substitution on a phenolic ring with an excess of a hydrocarbyl disulfide in the presence of an aluminum phenoxide catalyst so that (hydrocarbylthio)phenol is prepared containing at least two hydrocarbylthio groups on a phenolic ring, the molar ratio of said catalyst relative to said disulfide being between about 0.002 and 0.3.

4,533,754

PREPARATION OF ALDEHYDES FROM ARYL ACID HALIDES AND ORGANOZINC COMPOUNDS WITH COMPLEX PALLADIUM CATALYSTS

Roger A. Grey, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 23, 1984, Ser. No. 633,546

Int. Cl.³ C07C *45/00*

U.S. Cl. 568—437 **18 Claims**

1. A process for the preparation of an aldehyde of the formula

wherein R is a substituted or unsubstituted aryl group containing one or more benzenoid rings which may be fused or joined by single valency bonds, said substituents being selected from halides, alkyl, aryl, nitro, cyano, amido, keto or alkoxy groups, which comprises reacting in a solvent at a temperature of from about −78° C. to 200° C., an organic acid halide of the formula

wherein R is as hereinabove described, and X is a halide, with an organozinc compound of the formula $(R')_2Zn$ or $R'ZnX$ wherein R' is a straight or branched chain alkyl group containing from 2 to 20 carbon atoms and X is a halide, in the presence of a palladium metal complex catalyst selected from $(Ph_3P)_2PdCH_2Ph(Cl)$, $(Ph_3As)_4Pd$ or $(Ph_3P)_4Pd$.

4,533,755

PROCESS FOR THE HYDROFORMYLATION OF OLEFINS

Boy Cornils, Dinslaken; Josef Hibbel, Oberhausen; Gunther Kessen, Oberhausen; Werner Konkol, Oberhausen; Bernhard Lieder, Bottrop; Ernst Wiebus, Oberhausen; Heinz Kalbfell, Schermbeck, and Hanswilhelm Bach, Duisburg, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,788

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245883

Int. Cl.³ C07C *45/50, 27/20*

U.S. Cl. 568—454 **9 Claims**

1. A method for the hydroformylation of an olefin having 2 to 5 carbon atoms comprising

(a) subjecting said olefin to a low pressure hydroformylation reaction with synthesis gas in the presence of a water-soluble phosphine-rhodium catalyst to yield a first product and a waste gas, said waste gas containing an unreacted portion of said olefin,

(b) recovering and compressing said waste gas, and

(c) subjecting the compressed waste gas to a high pressure hydroformylation reaction in the presence of a cobalt catalyst.

4,533,756

PROCESS FOR SYNTHESIS OF ACRYLIC ACID PRECURSORS VIA HYDROFORMYLATION OF VINYL ETHER

Jiang-Jen Lin, Round Rock, and Walter H. Brader, Jr., Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 7, 1983, Ser. No. 548,909

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **12 Claims**

1. A process for preparing acrylic acid precursors which comprises the steps of contacting a vinyl ether selected from

the group consisting of n-butyl vinyl ether, vinyl phenyl ether, ethyl vinyl ether, vinyl ether, vinyl methyl ether, and vinyl sec-butyl, ether, carbon monoxide and hydrogen with a catalyst system comprising a rhodium-carbonyl compound and a phosphine ligand selected from the group consisting of triphenylphosphine, tri-n-butylphosphine and 1,1'-bis(diphenylphosphine)ferrocene, heating resultant reaction mixture under a pressure of 100 psi to 1000 psi at a temperature of 50° C. to about 150° C. and isolating said precursors of the group including 2- and 3-ethoxypropanal.

4,533,757

CONTINUOUS HYDROFORMYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS

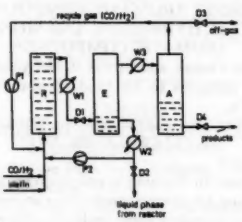
Rudolf Kummer, Frankenthal; Wolfgang Richter, Ludwigshafen; Kurt Schwirten, Frankenthal, and Peter Stops, Altrip, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 16, 1984, Ser. No. 570,988

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301591

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **12 Claims**



1. In a process for the manufacture of aldehydes and alcohols by continuous hydroformylation of an olefinically unsaturated compound having up to 12 carbon atoms with carbon monoxide and hydrogen, said process being carried out in a hydroformylation reactor under a pressure from 2 to 30 bar and at a temperature from 80° to 130° C. in the presence of a rhodium complex catalyst which contains, as ligands, sparingly volatile compounds of the formula

I

where A is phosphorus, arsenic, antimony or bismuth and R^1, R^2 and R^3 are each organic radicals and by subsequent separation of said aldehydes and alcohols from the hydroformylation reaction mixture, the improvement which comprises:

introducing the hydroformylation mixture as a crude reaction product consisting of both its liquid and gaseous components from the reactor into a devolatilization column;

devolatilizing said mixture in said column for a short time at a temperature which is higher and/or at a pressure which is lower than that prevailing in the hydroformylation reactor, and at the same time separating said reaction mixture in said column into a gas phase and a liquid phase;

cooling the gas phase from said column and conducting it to a separator to recover (a) a liquid product containing the produced aldehydes and alcohols and (b) a recycle gas; and

recycling part of the gas from said separator to said reactor after removing a waste gas therefrom, and also recycling at least part of the liquid phase from the devolatilization column to said reactor.

4,533,758

ALKYLATION OF PHENOLS TO ALKYL ARYL ETHERS USING PHOSPHATE CATALYSTS

James E. Wells, Ardmore, Pa., and Victoria Eskinazi, Cleveland Heights, Ohio, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 440,133, Nov. 8, 1982, Pat. No. 4,450,306, and a continuation-in-part of Ser. No. 381,232, May 24, 1982,. This application Jan. 19, 1984, Ser. No. 572,098

Int. Cl.³ C07C *41/09*

U.S. Cl. 658—630 **17 Claims**

1. In a method for the alkylation of phenols by alcohols to yield alkyl aryl ethers, the improvement which comprises: carrying out the reaction at a temperature between 250° C.–350° C. in the presence of a catalyst selected from the group consisting of the pyrophosphate, monohydrogen phosphate and dihydrogen phosphate of strontium, copper, magnesium, calcium, barium, zinc, lanthanum, aluminum, cobalt, nickel, cerium and neodymium and mixtures thereof.

4,533,759

PROCESS FOR THE PRODUCTION OF FRAGRANCE QUALITY ETHYLENE GLYCOL MONOARYL ETHERS

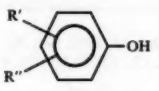
Eugene G. Harris, West Chester, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 367,128, Apr. 9, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 628,557

Int. Cl.³ C07C *41/34, 41/03*

U.S. Cl. 568—648 **9 Claims**

1. An improved process for the preparation of ethylene glycol monoaryl ethers which comprises combining 0.01 to 1.0 wt. percent alkali metal hydroxide and 0.01 to 1 weight percent alkali metal borohydride with a phenolic compound of the formula



where R' and R'' are hydrogen or an alkyl, alkenyl or alkoxyl group having from 1 to 8 carbon atoms, said phenol maintained at a temperature above its melting point, reacting with essentially one molar equivalent ethylene oxide at a temperature from 100° C. to 150° C. and pressure from atmospheric up to 1000 psi, neutralizing to a pH of 6.5–7.5 with an aliphatic di- or higher polycarboxylic acid or hydroxyaliphatic carboxylic acid and removing any insoluble salts.

4,533,760

PROCESS FOR REDUCING ORGANIC COMPOUNDS WITH CALCIUM, AMINE, AND ALCOHOL

Robert A. Benkeser, West Lafayette, Ind.; James A. Laugal, Lostant, Ill., and Angela Rappa, Baltimore, Md., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 23, 1984, Ser. No. 643,649

Int. Cl.³ C07C *5/10*

U.S. Cl. 568—667 **17 Claims**

1. A method for reducing an organic compound having at least one benzene ring and obtaining therefrom a cyclic olefin having the same structure as such organic compound except for degree of unsaturation, which comprises contacting such organic compound with a reaction mixture comprising calcium metal, ethylenediamine, and a low molecular weight aliphatic alcohol at a temperature of about −10° C. to about 30° C., for a period of time sufficient to effect the said reduction, the proportion of calcium metal to such organic compound being

at least about 10% in excess of the stoichiometric quantity necessary for complete reduction of such benzene ring, whereby a cyclic polyolefin is obtained having at least two double bonds.

4,533,761

METHOD FOR PREPARING BUTENE DIETHERS

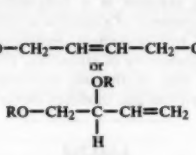
Marvin L. Peterson, Woodstown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 519,212, Aug. 2, 1983, abandoned, which is a continuation of Ser. No. 359,044, Mar. 17, 1982, abandoned. This application Jun. 13, 1984, Ser. No. 620,317

Int. Cl.[3] C07C *41/06*

U.S. Cl. 568—673 2 Claims

1. In a process for preparing a butene diether represented by the structure



where R is a linear or branched alkyl radical of 1–4 carbon atoms, from 1,3-butadiene and a linear or branched alkanol of 1–4 carbon atoms, the use of a catalyst system consisting of an alkali metal iodide and copper compounds, which are copper halides or copper salts of organic acids and which will provide copper ions having an average oxidation state of 1–2.

4,533,762

PREPARATION OF CHLOROTRIFLUOROETHYLENE TELOMERS WITH BISFLUOROXYDIFLUOROMETHANE

Donald H. Campbell, Niagara-on-the-Lake, Canada; Michael J. Fifolt, and Mohan S. Saran, both of Grand Island, N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 24, 1983, Ser. No. 545,018

Int. Cl.[3] C07C *179/00, 43/00*

U.S. Cl. 568—677 8 Claims

1. A process for producing telomers consisting essentially of reacting chlorotrifluoroethylene with bisfluoroxydifluoromethane.

4,533,763

HYDROXY AROMATIC COMPOUNDS FROM ALKALI METAL HYDROXIDE AND MONONUCLEAR AROMATIC COMPOUND

Barton Milligan, Coplay, and George B. DeLaMater, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 14, 1983, Ser. No. 561,615

Int. Cl.[3] C07C *39/02*

U.S. Cl. 568—716 7 Claims

1. In a process for forming a mono hydroxy mononuclear aromatic compound by reacting a mononuclear aromatic compound with a hydroxyl providing agent under conditions effective for forming a hydroxy mononuclear aromatic compound, the improvement which comprises:

forming an intermediate reaction product of a benzene, toluene or xylene by effecting reaction between said benzene, toluene or xylene and an alkali metal hydroxide, said reaction carried out at a temperature from 200°–300° C. in the presence of a metallic hydrogenation catalyst, said catalyst being present in an amount effective for catalyzing the reaction between the alkali metal hydroxide and benzene, toluene or xylene; and

adding an aqueous mineral acid to the intermediate reaction product in sufficient amount to liberate the hydroxy mononuclear aromatic compound.

4,533,764

PURIFICATION OF BISPHENOLS BY REMOVING RESIDUAL SOLVENT

Feng-Chih Chang; Susan A. Wernil, and David E. Busby, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 29, 1984, Ser. No. 594,963

Int. Cl.[3] C07C *37/84*

U.S. Cl. 568—724 7 Claims

1. A process for purifying a bisphenol to remove small amounts of organic solvent remaining from a crystallization which comprises (a) adding bisphenol crystals containing said solvent to water maintained at a temperature which will produce a water-bisphenol molten phase, (b) maintaining that temperature for a period of time sufficient to permit the organic solvent to transfer to said water, (c) flash distilling substantially all of said solvent away from said water, (d) cooling said molten bisphenol-water phase to precipitate the crystalline bisphenol, and (e) separating said crystalline bisphenol from said water and (f) drying said crystalline bisphenol.

4,533,765

POLYHYDROXY AROMATIC COMPOUNDS FROM ALKALI METAL HYDROXIDE AND MONONUCLEAR AROMATIC COMPOUNDS

Barton Milligan, Coplay, and George B. DeLaMater, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 7, 1983, Ser. No. 559,078

Int. Cl.[3] C07C *37/00, 39/10*

U.S. Cl. 568—763 6 Claims

1. In a process for forming a polyhydroxy aromatic compound by reacting a hydroxymononuclear aromatic compound with a hydroxyl providing agent under conditions effective for forming said polyhydroxy mononuclear aromatic compound, the improvement which comprises:

utilizing rescorcinol or phenol as said hydroxy mononuclear aromatic compound;

forming a salt of a polyhydroxy aromatic compound by effecting reaction between said phenol or rescorcinol and an alkali metal hydroxide at a temperature from 300° to 400° C., said reaction carried out in the presence of a nickel or cobalt metallic hydrogenation catalyst, said catalyst being present in an amount effect catalyzing the reaction between the alkali metal hydroxide the phenol or rescorcinol;

adding a protonating agent to the salt of the polyhydroxy aromatic compound in sufficient amount to libera the polyhydroxy aromatic compound.

4,533,766

PROCESS FOR THE PRODUCTION OF DIHYDROXYBENZENES

Karlheinz Drauz, Freigericht, and Axel Kleemann, Hanau, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,654

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308769

Int. Cl.[3] C07C *37/00*

U.S. Cl. 568—771 30 Claims

1. A process for the production of a substituted dihydroxybenzene, a hydroxy alkoxy benzene, a substituted hydroxy alkoxy benzene, a dihydroxy anthracene, a dihydroxy naphthalene, a dihydroxy alkyl naphthalene, a hydroxynaphthyl ether, a hydroxyphenanthryl ether, a hydroxyanthracenyl ether or a dihydroxy phenanthrene by nuclear hydroxylation of phenol with hydrogen peroxide in a substantially water-free organic solvent in the presence of a catalyst comprising reacting an

alkyl phenol, an aryl phenol, a halophenol, an alkoxyphenol, an alkoxy benzene, an alkyl phenol alkyl ether, a naphthol, a hydroxy anthracene, a hydroxy 1 to 4 carbon alkyl naphthalene, a hydroxy phenylnaphthalene, a hydroxy methoxynaphthalene, a cyclohexyl phenol, or a hydroxy phenanthrene with hydrogen peroxide in a solution in substantially water-free organic solvent which solvent forms an azeotrope with water, the boiling point of the azetrope being below the boiling point of hydrogen peroxide, based on normal pressure, said reaction being carried out in the presence of sulfur dioxide as a catalyst.

4,533,767

CATALYTIC HYDRODEALKYLATION OF ALKYLATED PHENOLS

John J. Talley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 3, 1984, Ser. No. 606,438
Int. Cl.³ C07C *37/50, 37/48*
U.S. Cl. 568—805 **25 Claims**

1. A method of removing one or more alkyl radicals that are ortho or para positioned with respect to the hydroxyl radical of alkylated phenols with substantially no dehydroxylation comprising reacting an alkylated phenol with steam in the presence of a catalyst comprising magnesium oxide and an oxidizing atmosphere at a temperature in the range of about 400° to 675° C., said alkylated phenols having at least one alkyl radical either ortho-positioned or para-positioned to the hydroxyl radical, the alkyl radicals of said alkylated phenols having from 1 to 6 carbon atoms.

4,533,768

ZINC OXIDE CATALYZED DEALKYLATION OF ALKYLATED PHENOLS

John J. Talley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 3, 1984, Ser. No. 606,504
Int. Cl.³ C07C *37/50*
U.S. Cl. 568—805 **20 Claims**

1. A method of removing one or more alkyl groups containing 1–6 carbon atoms from the aromatic nucleus of alkylated phenols that are ortho-positioned or para-positioned with respect to the hydroxy group with substantially no dehydroxylation comprising reacting an alkylated phenol with steam in the presence of a catalyst comprising zinc oxide and an oxidizing atmosphere at a temperature in the range of about 400° to 675° C., said alkylated phenols having at least one alkyl radical of from 1 to 6 carbon atoms either ortho-positioned or para-positioned to the hydroxyl radical.

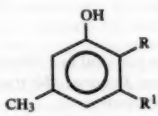
4,533,769

METHOD OF MAKING METHYLATED PHENOL FROM METHYLATED CYCLOHEXENEONE

John J. Talley, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1984, Ser. No. 613,545
Int. Cl.³ C07C *37/07, 37/00*
U.S. Cl. 568—806 **3 Claims**

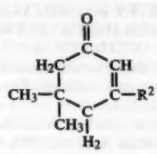
1. A method for making a methylated phenol having the formula,



(1)

which comprises

(1) pyrolyzing at a temperature in the range of from 300° C. to 700° C., a polymethylated cyclohexene-1-one having the formula



(2)

in the presence of an effective amount of a demethanation catalyst consisting essentially of the calcination residue of a mixture of magnesium carbonate and/or magnesium hydroxide and a manganese compound

(2) recovering the methylated phenol from the mixture of (1),

where R is a member selected from hydrogen or methyl, R^1 is a member selected from hydroxy, —OR^3 and methyl, R^2 is selected from methyl and —OR^3 and R^3 is a $C_{(1-6)}$ alkyl radical.

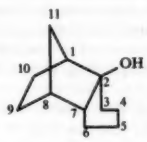
4,533,770

2-EXO-HYDROXY-ENDO-TRICYCLO[6.2.1.0^{2,7}]UNDECANE

Naotake Takaishi, Utsunomiya; Hitoshi Takahashi, Ichikaimachi, and Yoshiaki Inamoto, Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,553
Claims priority, application Japan, Jul. 15, 1983, 58-129233
Int. Cl.³ C07C *35/22*
U.S. Cl. 568—817 **1 Claim**

1. 2-Exo-hydroxy-endo-tricyclo[6.2.1.0^{2,7}]undecane represented by the following formula (I):



(I)

4,533,771

PROCESS FOR THE PREPARATION OF TRIFLUOROETHANOL

Georges Cordier, Francheville, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Apr. 5, 1984, Ser. No. 596,938
Claims priority, application France, Apr. 21, 1983, 83 06530
Int. Cl.³ C07C *29/136, 31/38*
U.S. Cl. 568—842 **18 Claims**

1. A process for the preparation of trifluoroethanol by the hydrogenation of trifluoroacetic acid in the liquid phase, which comprises the steps of:

reacting hydrogen with trifluoroacetic acid in the liquid phase in a reactor in the presence of a catalyst based on a metal selected from the group consisting of ruthenium, rhodium, iridium and platinum, under a total pressure of between 5 and 50 bar, the ratio of the volume of the liquid phase used in the reactor to the total volume of the reactor being more than about ½; and

maintaining an absolute partial pressure of hydrogen of more than 1 bar during the reaction.

4,533,772

PROCESS FOR DIRECTLY HYDROXYLATING OLEFINS USING AN OSMIUM-HALIDE CATALYST AND OXYGEN OXIDANT

Robert C. Michaelson, Waldwick, and Richard G. Austin, Ridgewood, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 310,217, Oct. 9, 1981, abandoned. This application Aug. 29, 1983, Ser. No. 527,352

Int. Cl.[3] C07C *29/03, 35/06, 35/14, 35/20*

U.S. Cl. 568—860 45 Claims

1. A process for hydroxylating at least one olefinic compound having at least one ethylenic unsaturation which comprises reacting said olefinic compound in admixture with water, a molecular oxygen containing oxidant, and an unsupported catalyst composition comprising (i) at least one catalyst (a) being capable of catalyzing said hydroxylation reaction, and (b) being initially added to said admixture as at least one osmium-halide; and (ii) a copper containing co-catalyst; said reaction being conducted in a manner and under conditions sufficient to convert at least one of said ethylenic unsaturation to its corresponding diol.

4,533,773

PROCESS FOR HYDROXYLATING OLEFINS IN THE PRESENCE OF AN OSMIUM OXIDE CATALYST AND CARBOXYLATE SALT CO-CATALYST

Robert C. Michaelson, Waldwick, and Richard G. Austin, Ridgewood, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 394,414, Jul. 1, 1982, abandoned. This application Mar. 22, 1984, Ser. No. 592,284

Int. Cl.[3] C07C *29/04, 31/18, 31/22, 31/42*

U.S. Cl. 568—860 10 Claims

1. A process for hydroxylating olefins which comprises reacting at least one olefinic compound having at least one ethylenic unsaturation and which is not a carboxylic acid or salt thereof, with at least one organic hydroperoxide and water in the presence of a catalyst composition under conditions and in a manner sufficient to convert at least one of said ethylenic unsaturation to its corresponding vicinal diol, said catalyst composition comprising:

(a) at least one unsupported osmium oxide capable of catalyzing said hydroxylation reaction; and

(b) as a co-catalyst at least one organic carboxylate salt having a cation and an anion, said cation being selected from the group consisting of tetrahydrocarbyl phosphonium and cations of Fe, Co, Ni, Cu, and Mn; said co-catalyst being capable of increasing at least one of the rate and selectivity of the hydroxylation reaction to product diol relative to the rate and selectivity in the absence of said co-catalyst.

4,533,774

PROCESS FOR THE PRODUCTION OF ETHYLENE GLYCOL

Colin G. Griggs, Ashford, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Nov. 23, 1983, Ser. No. 554,846

Claims priority, application United Kingdom, Nov. 27, 1982, 8233896

Int. Cl.[3] C07C *31/20, 29/00*

U.S. Cl. 568—866 9 Claims

1. In a process for the production of ethylene glycol by reacting at elevated temperature methanol, formaldehyde, and an organic peroxide having the formula R—O—O—R^1 wherein R and R^1 are independently either alkyl or aralkyl groups containing from 3 to 12 carbon atoms,

the improvement which comprises adding the formaldehyde in the form of a polymeric source thereof, and

wherein the amount of water present is less than 0.5% by weight, based on the total weight of reactants.

2. A process according to claim 1 wherein the polymeric source of formaldehyde is trioxane.

3. A process according to claim 1 wherein the polymeric source of formaldehyde is paraformaldehyde.

4,533,775

PROCESS FOR THE UPGRADING OF LOWER ALCOHOLS TO HIGHER MOLECULAR WEIGHT ALCOHOLS

Joseph R. Fox, Solon; Frederick A. Pesa, Aurora, and Benedict S. Curatolo, Maple Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Apr. 25, 1983, Ser. No. 488,286

Int. Cl.[3] C07C *29/34*

U.S. Cl. 568—905 9 Claims

1. A process for the upgrading of methanol to substantially isobutanol and other higher molecular weight alcohol products comprising contacting methanol in the vapor phase with a reaction promoter composition at a reaction temperature of about 25° C. to about 600° C., wherein said promoter composition is selected from:

(a) A metal acetylide represented by the formula

$$Ma_2C_2 \quad (I)$$

wherein Ma is selected from Li, Na, K, Rb, Cs, Cu, Ag, Au and mixtures thereof; or

$$MeC_2 \quad (II)$$

wherein Me is selected from La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, and mixtures thereof;

(b) A hydride of a metal selected from Mg, Ca, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu and mixtures thereof; and

(c) A mixture of reaction promoter compositions of groups (a) and (b).

4,533,776

PREPARATION OF FLUORINATED NITROALKANES

Bernd Baasner; Hermann Hagemann, both of Leverkusen, and Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

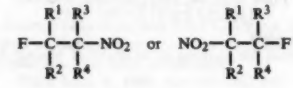
Filed Feb. 1, 1984, Ser. No. 575,649

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305201

Int. Cl.[3] C07C *79/12*

U.S. Cl. 568—946 19 Claims

1. In the preparation of an α-fluorinated nitroalkane of the formula



(Ia) (Ib)

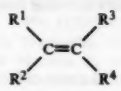
in which

R^1, R^2, R^3 and R^4 are identical or different and individually represent hydrogen, fluorine, chlorine, bromine, alkyl, halogenoalkyl or cycloalkyl, or

R^1 and R^3 have the meaning indicated and

R^2 and R^4 together represent an alkylene group having 3–6 carbon atoms,

by conjugated nitrofluorination of the corresponding olefin of the formula



the improvement which comprises carrying out the reaction in the presence of an agent which binds water.

4,533,777

PROCESS FOR THE PREPARATION OF AROMATIC TRIFLUOROMETHYL COMPOUNDS

Albrecht Marhold, Leverkusen, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

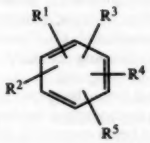
Filed Aug. 13, 1979, Ser. No. 65,776

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1978, 2837499

Int. Cl.³ C07C *17/32*

U.S. Cl. 570—144 6 Claims

1. A method for adding a trifluoromethyl group to the ring of a benzene ring compound which comprises contacting an aromatic compound of the formula



wherein

R^1 denotes hydrogen, alkyl, phenyl, phenyloxy or phenylthio,

R^2, R^3 and R^4, are identical or different and denote hydrogen, halogen, or methyl and

R^5 is hydrogen or alkyl

and 2 adjacent radicals of the group R^1 through R^5 being able to jointly form a 3- to 5-membered alkylene radical with carbon tetrachloride and hydrogen fluoride at a temperature in the range of 50° to 140° C., the reaction mixture consisting essentially of said aromatic compound, said carbon tetrachloride, and said hydrogen fluoride.

4,533,778

TRACTION FLUID LUBRICANTS DERIVED FROM MINERAL OIL

Harry E. Henderson, Sarnia, and Clinton R. Smith, Camlachie, both of Canada, assignors to Imperial Oil Limited, Toronto, Canada

Continuation-in-part of Ser. No. 226,628, Jan. 21, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,730

Int. Cl.³ C10M *1/04*

U.S. Cl. 585—13 14 Claims

1. In the method of operating a traction drive the improvement comprising using as the traction fluid a fluid having a lubricant basestock comprising a selected mineral oil composition which contains a saturate fraction having at least about 35% by volume of multiring components of at least three rings and an aromatic fraction which comprises at least about 15% by weight of said composition and wherein the weight ratio of aromatic fraction to saturate fraction is at least about 0.2:1, said aromatic fraction containing at least about 40% by volume of multiring components having two or more rings at least one of which is an aromatic ring, said traction fluid having a viscosity of at least about 40 cSt at 30° C. and a Traction Index of at least about 0.65.

4,533,779

SUPPORTED PALLADIUM-GOLD CATALYST, ITS MANUFACTURE AND USE IN REACTIONS FOR THE SELECTIVE HYDROGENATION OF DIOLEFINIC AND/OR ACETYLENIC HYDROCARBONS

Jean-Paul Boitiaux, Paris, and Jean Oosyns, Maule, both of France, assignors to Ste Francaise des Produits pour Catalyse chez Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 475,651, Mar. 15, 1983, Pat. No. 4,490,481. This application Nov. 20, 1984, Ser. No. 672,754

Claims priority, application France, Mar. 15, 1982, 82 04477

Int. Cl.³ C07C *7/163, 5/03, 5/05*

U.S. Cl. 585—259 20 Claims

1. In a process comprising selectively hydrogenating diolefinic hydrocarbons in contact with a catalyst, the improvement wherein the catalyst is produced by a process consisting essentially of the sequential steps of: admixing a palladium compound with an inorganic carrier, roasting in the presence of an oxygen-containing gas, treating with a reducing agent, admixing a halogenated gold compound with the resultant composition, treating with a reducing agent, washing with an aqueous solution of a compound having a basic reaction so as to lower the halogen content of the catalyst below 10 ppm by weight, and roasting in the presence of an oxygen-containing gas, the palladium and gold compounds being used in amounts such that the resultant catalyst contains 0.03 to 1% palladium and 0.003 to 0.3% gold by weight.

4,533,780

NATURAL GAS CONVERSION

Gennaro J. Maffia, Wallingford, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 16, 1984, Ser. No. 601,139

Int. Cl.³ C07C *1/00*

U.S. Cl. 585—330 2 Claims

1. A method for converting lower alkanes to higher hydrocarbon products which comprises:

(a) separating a mixture comprising lower alkanes to form a first fraction enriched in methane relative to said mixture and at least one second fraction enriched in C_2+ alkanes relative to said mixture;

(b) dehydrogenating said second fraction to form a dehydrogenation effluent comprising C_2+ olefins;

(c) contacting said first fraction with a solid to form a redox effluent comprising C_2+ olefins, said solid comprising at least one reducible oxide of at least one metal which oxides when contacted with methane at temperatures selected within the range of about 500° to 1000° C. are reduced and produce higher hydrocarbon products and water; and

(d) oligomerizing the C_2+ olefins in said dehydrogenation effluent and in said redox effluent to form higher hydrocarbon products.

4,533,781

PROCESS FOR PREPARING 4-METHYL-1-PENTENE

Mitsuo Matsuno, Kawasaki; Michio Kudoh, and Hiroshuke Imai, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Japan

Filed Oct. 26, 1984, Ser. No. 665,307

Claims priority, application Japan, Oct. 29, 1983, 58-203508; Dec. 13, 1983, 58-233654; Apr. 11, 1984, 59-70915

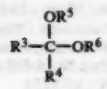
Int. Cl.³ C07C *3/02*

U.S. Cl. 585—516 14 Claims

1. A process for preparing 4-methyl-1-pentene by the dimerization reaction of propylene in the presence of a catalyst being prepared by bringing a catalyst precursor in contact with at least one oxygen-containing compound selected from the group consisting of oxygen, alcohols containing 1 - 5 carbon atoms, ethers represented by the following formula (2):

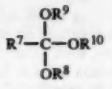
$$R^1OR^2 \quad (2)$$

wherein R^1 and R^2 mean individually a hydrocarbon residual group containing 1–5 carbon atoms, acetals represented by the following formula (3):



(3)

wherein R^3, R^4 and R^5 denote individually a hydrogen atom or a hydrocarbon residual group containing 1–5 carbon atoms and R^6 means a hydrocarbon residual group containing 1–5 carbon atoms, orthocarboxylates represented by the following formula (4):



(4)

wherein R^7 is a hydrogen atom or a hydrocarbon residual group containing 1–5 carbon atoms, and R^8, and R^9 and R^{10} mean individually a hydrocarbon residual group containing 1–5 carbon atoms, and esters represented by the following formula (5):

$$R^{11}COOR^{12} \quad (5)$$

wherein R^{11} means a hydrogen atom or a chain or cyclic, aliphatic hydrocarbon residual group containing 1–15 carbon atoms or an aryl or aralkyl group containing 6–20 carbon atoms, and R^{12} means a hydrocarbon residual group containing 1–5 carbon atoms; wherein the catalyst precursor consists of at least one element or compound selected from the group consisting of sodium, potassium, sodium amide and potassium amide supported on a carrier consisting principally of a compound represented by the following formula (1)

$$K_2O.xAl_2O_3 \quad (1)$$

wherein x has a value in the range of $0.5 \leqq x \leqq 11$, wherein the catalyst precursor is optionally hydrogenated prior to the use thereof.

4,533,782

METHOD AND CATALYST FOR POLYMERIZING A CATIONIC POLYMERIZABLE MONOMER

Aspet V. Merijanian, Middlebury, Conn., assignor to Uniroyal, Inc., Middlebury, Conn.

Filed Sep. 8, 1983, Ser. No. 530,334

Int. Cl.[3] **C07C** *2/02*

U.S. Cl. 585—520 **8 Claims**

1. A process for polymerizing cationically polymerizable monomers comprising:

(A) providing a solution containing an activated catalyst comprising

(a) an aluminum compound having the formula R_nAlX_{3-n}, wherein n is an integer from 0 to 3; R is C_1–C_{12} alkyl, C_7–C_8 aralkyl, C_7–C_{18} alkaryl or C_6–C_{10} aryl; and X is Cl, Br or I; and

(b) (1) a compound having the formula R'X, which is reactive with (a), wherein X is Cl, Br or I and R' is C_1–C_{24} alkyl, C_3–C_{20} alkenyl, C_5–C_9 bridged or non-bridged cycloalkyl or cycloalkenyl, C_7–C_9 aralkyl or (2) a hydrocarbon polymer carrying at least one X substituent wherein X is Cl, Br or I; and

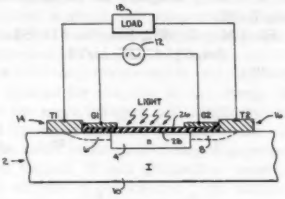
(c) a solvent selected from the group consisting of toluene, xylene or C_1–C_{12} hydrocarbon having F, Cl or Br substituents, said solvent being essentially inert to the mixture of (a) and (b), said solvent being present in an amount sufficient to solubilize the activated catalyst; and

(B) contacting cationically polymerizable monomers with the solution of activated catalyst of (A).

4,533,783
AC SOLAR CELL WITH ALTERNATELY GENERATED PN JUNCTIONS

James A. Benjamin, Waukesha, Wis.; Robert W. Lade, Fort Myers, Fla., and Herman P. Schutten, Milwaukee, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 8, 1984, Ser. No. 618,440
Int. Cl.[3] H01L 31/06
U.S. Cl. 136—249 10 Claims



1. An AC solar cell comprising:

a central region of given conductivity type semiconductor material between first and second regions of intrinsic or invertable semiconductor material;

first and second gate electrodes for respective said first and second intrinsic or invertable regions, and AC gate driver means for applying alternating polarity gate potential to said first and second gate electrodes, such that during the first half cycle said first intrinsic or invertable region is converted to one conductivity type and said second intrinsic or invertable region is converted to the opposite conductivity type, and such that during the second half cycle said first intrinsic or invertable region is converted to said opposite conductivity type and said second intrinsic or invertable region is converted to said one conductivity type;

first and second terminal connection means for respective said first and second intrinsic or invertable regions, such that during the first half cycle hole-electron pairs generated by light radiation diffuse across the pn junction between said central region and one of said converted intrinsic or invertable regions to set up a potential gradient which drives current in one direction between said first and second terminal connection means, and such that during the second half cycle hole-electron pairs generated by light radiation diffuse across the pn junction between said central region and the other of said converted intrinsic or invertable regions to set up a potential gradient which drives current in the opposite direction between said first and second terminal connection means, to generate alternating current between said first and second terminal connection means.

4,533,784
SHEET MATERIAL FOR AND A CABLE HAVING AN EXTENSIBLE ELECTRICAL SHIELD

Murray Olyphant, Jr., Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Jul. 29, 1983, Ser. No. 518,433
Int. Cl.[3] H01B 11/06
U.S. Cl. 174—36 13 Claims

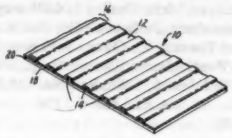
1. An electrical cable, comprising:

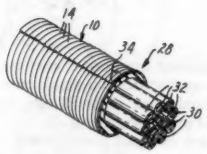
at least one conductor;

insulation encasing said at least one conductor;

a sheet material comprising a continuous metallic foil having a plurality of flattened transverse folds forming a plurality of transverse overlaps having a nonlinear yield behavior; and

securing means coupling said sheet material to said insulation;



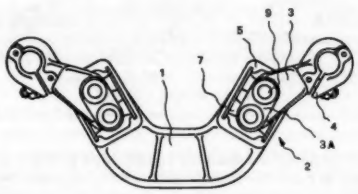


whereby a shielded cable is provided having exceptional flexibility.

4,533,785
SPACER-DAMPER FOR A BUNDLED CONDUCTOR FOR AN ELECTRIC LINE

Innocente Riganti, Solbiate Arno, Italy, assignor to Innocente Riganti Officine Meccaniche S.p.A., Solbiate Arno, Italy

Filed Sep. 19, 1983, Ser. No. 533,536
Claims priority, application Italy, Sep. 17, 1982, 23315 A/82
Int. Cl.[3] H02G 7/14, 7/12
U.S. Cl. 174—42 33 Claims



1. A device for spacing apart and damping bundled subconductors of an electrical conductor, said device comprising a support; a plurality of arms; clamping means on each of said arms for clamping a subconductor; and a joint for each of said arms connecting the respective arm with said support, at least one of said joints including a frame on said support, a core disposed within said frame and connected with the respective arm, and at least two pairs of elastic elements between said core and said frame.

4,533,786

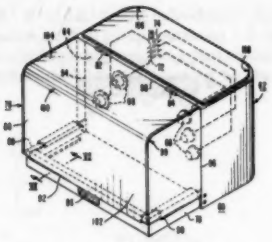
PADMOUNTED TRANSFORMER ENCLOSURE

Virgil L. Borgmeyer, Meta; Dudley L. Galloway, Jefferson City; Gary N. Sonnenberg, Jefferson City; Jan S. Gruczka, Jefferson City, and Timothy C. Owen, Jefferson City, all of Mo., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1984, Ser. No. 618,845

Int. Cl.³ H05K 5/04

U.S. Cl. 174—50 8 Claims



1. A padmounted transformer enclosure, comprising:

a tank having electrical terminals on a predetermined wall, and a terminal cover pivotally attached to said tank to enclose said predetermined wall,

said tank and terminal cover, when closed, cooperatively defining a composite structure having a front portion formed by said terminal cover, a rear portion formed by said tank, and cooperatively formed side portions,

said front portion having a horizontally oriented upper edge, and said back portion having first and second substantially vertically oriented edges, all of which are radiused to eliminate sharp points at the upper corners of said composite structure.

4,533,787

PRINTED CIRCUIT ASSEMBLY

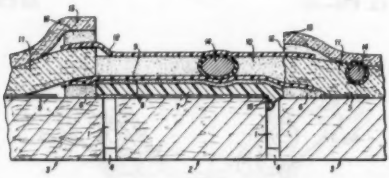
Fredy Anderegg, Lohn; Josef Furrer, Luterbach, and Heinz Däppen, Flumenthal, all of Switzerland, assignors to Autophon AG., Soleure, Switzerland

Filed Nov. 12, 1982, Ser. No. 440,999

Claims priority, application Switzerland, Nov. 26, 1981, 7559/81

Int. Cl.³ H05K 1/03

U.S. Cl. 174—68.5 2 Claims



1. In a circuit board assembly comprising a plurality of rigid parts and at least one flexible part connecting each two said rigid parts, said flexible part comprising an upper and a lower non adhesive flexible film, the board further comprising wires, at least a part of these wires running uniterruptedly from one of said rigid parts over said flexible part to an adjacent one of said rigid parts, said wires in all parts being embedded in a layer of thermally activatable adhesive, said adhesive is, in the flexible parts, disposed between the non adhesive films, and, in the rigid parts, disposed on a rigid base plate and, including the wires, covered by a cover layer, the improvement that the non adhesive films extending solely between said two rigid parts and being secured thereto at the edges thereof and that two kinds of adhesive layers are disposed, the layer on said rigid parts containing a glass-fiber fabric and the adhesive in said flexible part is fiber-free.

4,533,788

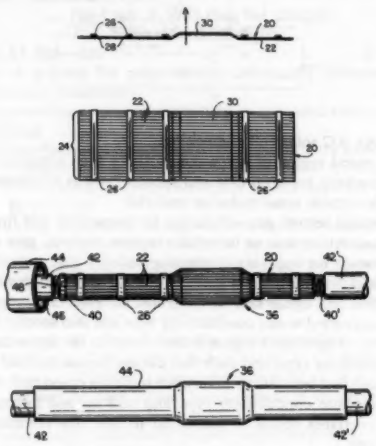
ASSEMBLY AND METHOD FOR CABLE JOINT PROTECTION

Rudolf Pokojny, San Jose, and Peter L. Larsson, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 3, 1982, Ser. No. 374,558

Int. Cl.³ H02G 15/18

U.S. Cl. 174—88 C 8 Claims



1. A wraparound liner which can surround longitudinally a cable splice of non-uniform cross-sectional size, which comprises:

(a) a plurality of side-by-side elongate elements which have a substantially rectangular crosssection and a non-linear configuration corresponding substantially to the profile of the cable splice; and

(b) means which holds the element together and which allows the separation between them to vary at a change in cross-sectional size of the cable splice as the liner is installed around the cable splice.

4,533,789

HIGH VOLTAGE ELECTRIC POWER CABLE WITH THERMAL EXPANSION ACCOMMODATION

Carlos Katz, Edison, N.J., assignor to Cable Technology Laboratories, Inc., New Brunswick, N.J.

Continuation of Ser. No. 465,802, Feb. 11, 1983, abandoned. This application Sep. 6, 1984, Ser. No. 647,878

Int. Cl.³ H01B 7/18

U.S. Cl. 174—102 R 18 Claims

1. A high voltage electric power cable adapted to withstand wide swings in temperature in which a thick layer of polymeric insulation material surrounds an electrically conductive core structure, an insulation shield comprising an electrically conductive member having a smaller coefficient of thermal expansion than said polymeric insulation material surrounds said layer of insulation material, and compressible means are interposed between said conductive member and said polymeric layer, characterized in that said compressible means comprises a structurally resiliently compressible and substantially shape recoverable element for adapting to any change in the radial dimension of the space between said conductive member and said layer of insulation material throughout the entire circum-

ference of the cable while maintaining engagement with the radially inner surface of said conductive member, and said compressible element is constructed from material having electrical conductivity of at least 1 micromho per centimeter.

8. A high voltage electric power cable adapted to withstand wide swings in temperature in which a thick layer of polymeric insulation material surrounds an electrically conductive core structure, an insulation shield comprising an electrically conductive member having a smaller coefficient of thermal expansion than said polymeric insulation material surrounds said layer of insulation material, and compressible means are interposed between said conductive member and said polymeric layer, characterized in that said compressible means comprises a structurally resiliently compressible and substantially shape recoverable element for adapting to any change in the radial dimension of the space between said conductive member and said layer of insulation material throughout the entire cicumference of the cable while maintaining engagement with the radially inner surface of said conductive member, and said compressible element is constructed from dielectric material having a dielectric constant of at least 4.

15. A high voltage electric power cable adapted to withstand wide swings in temperature in which a thick layer of polymeric insulation material surrounds an electrically conductive core structure, an insulation shield comprising an electrically conductive member having a smaller coefficient of thermal expansion than said polymeric insulation material surrounds said layer of insulation material, and compressible means are interposed between said conductive member and said polymeric layer, characterized in that said compressible means comprises a structurally resiliently compressible and substantially shape recoverable element for adapting to any change in the radial dimension of the space between said conductive member and said layer of insulation material throughout the entire circumference of the cable while maintaining engagement with the radially inner surface of said conductive member, and said compressible element consists essentially of an assembly of two structural components, one component being constructed from material having electrical conductivity of at least 1 micromho per centimeter, and the other component being constructed from dielectric material having a dielectric constant of at least 4.

4,533,790

ELECTRICAL CONDUCTOR ASSEMBLY

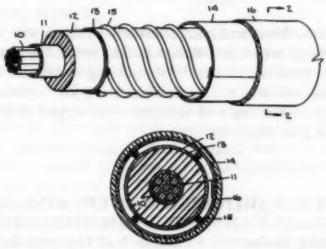
James J. Johnston, Old Saybrook, and Gregory L. Glynn, Mansfield Center, both of Conn., assignors to Akzona Incorporated, Ashville, N.C.

Continuation-in-part of Ser. No. 466,833, Feb. 16, 1983, abandoned. This application Mar. 13, 1984, Ser. No. 589,169

Int. Cl.[3] H01B *7/00*

U.S. Cl. 174—115 **17 Claims**

1. An electrical cable comprising a plurality of groups of axially elongated flexible electrical conductors including first, second and third groups, each of said groups including at least one electrical conductor, and a unitary flexible axially elongated jacket of dielectric material separating and insulating said conductors of each of said groups from said conductors of the other of said groups, said jacket having distinct axially elongated tubular portions including a first tubular portion containing said conductors of said first group, a second tubular portion containing said conductors of said second group and a third tubular portion containing said conductors of said third group, a plurality of integral axially elongated web portions hingedly connecting said tubular portions for movement relative to each other between a first position and a second position and including first and second web portions integrally connected to said first tubular portion at points of connection angularly spaced generally about the central axis of said first tubular portion, said first web hingedly connecting said second tubular portion to said first tubular portion, said second web hingedly connecting said third tubular portion to said first



tubular portion, said conductors of said second and third groups being disposed to one side of a plane passing through said points of connection and said conductors of said first group being disposed to the opposite side of said plane when said tubular portions are in said first position, said conductors of said first group, said second group and said third group being disposed to the same side of said plane when said tubular portions are in said second position, said first and second web portions cooperating with said tubular portions to maintain said tubular portions in generally side-by-side relation to each other with said first tubular portion disposed between said second tubular portion and said third tubular portion and with said second tubular and said third tubular portion in adjacent contacting engagement with said first tubular portion when said tubular portions are in said second portion.

4,533,791

INPUT/OUTPUT DEVICE ARRANGEMENTS FOR TERMINALS

Clifford D. Read, Almonte; William D. Sawyer, Kanata, and Donald T. Chadwick, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 5, 1982, Ser. No. 346,219

Int. Cl.[3] H04M *11/00*

U.S. Cl. 179—2 R **7 Claims**

1. A self-contained, table top electronic telecommunications terminal comprising a bottom moulding having an upstanding sidewall and a top moulding having a depending sidewall, said sidewalls of said bottom and top mouldings mating so that said mouldings form a cabinet for electronic circuitry, the forepart of said top moulding sloping downwardly toward the front of said cabinet, a control keypad on said sloping forepart of said top moulding for controlling the functions of the terminal, a visual display on said top moulding rearward of said control keypad, a telephone handset, cord means connecting said handset to said terminal, means for supporting said telephone handset on said top moulding adjacent said control keypad and said visual display, the sidewall of said bottom moulding defining a recess at the front of said cabinet, an alphanumeric key-

pad slidable into and out of said recess between a concealed first position in which said alphanumeric keypad is received in said cabinet underneath said control keypad and an exposed second position in which said alphanumeric keypad is accessible for use by an operator, the front of said alphanumeric keypad having a contour complementary to the contour of the

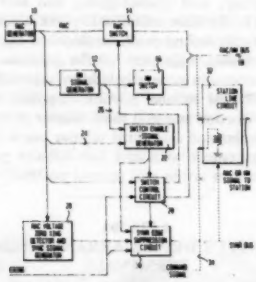
front of said cabinet and lying substantially flush with the front of said cabinet when said alphanumeric keypad is in said concealed first position, means for supporting electronic circuitry within said cabinet, and a flexible electrical connector for electrically connecting said alphanumeric keypad to electronic circuitry within said cabinet.

4,533,792

CIRCUIT FOR SWITCHING BETWEEN RING SIGNAL AND MESSAGE WAITING SIGNAL WITHOUT BELL TAP

Ronald Binks; Anthony S. Rehak, both of Deerfield Beach, and Howard Sinberg, Coral Springs, all of Fla., assignors to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Mar. 30, 1984, Ser. No. 595,155
Int. Cl.³ H04M *3/42*
U.S. Cl. 179—84 C **6 Claims**



1. A circuit for switching between a ring signal and a message waiting signal without bell tap in a telephone system, comprising:

(a) means for generating a composite RAC/MW signal which comprises an A-C signal and a D-C signal alternately spaced in time, the generating means comprising an RAC signal generator, an MW signal generator, and switching means for combining the RAC and MW signals into a composite RAC/MW signal;

(b) a switch enable-signal generator comprising a comparator for comparing the instantaneous value of the RAC signal with the value of the MW signal, the switch enable generator providing a signal for changing the composite signal from an A-C signal to a D-C signal only when the instantaneous value of the RAC signal equals the value of the MW signal and the slope is negative;

(c) means for producing either a RAC or MW signal to a particular subscriber station of a telephone system in response to an external command synchronous signal;

(d) a RAC voltage zero crossing detector and synchronous signal generator for detecting when the RAC signal crosses zero point, and controlling when the appropriate RAC or MW signal is provided to a subscriber station in the telephone system; and

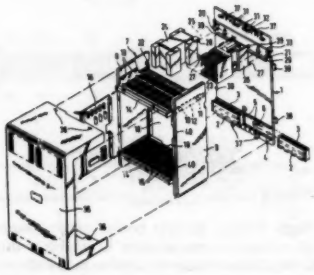
(e) a synchronous edge suppression circuit for supressing the first ring synchronous pulse from the ring synchronous signal when the means for providing either an RAC or MW signal to a particular subscriber station signals that an MW signal should be provided during the time interval between the A-C signal crossing the D-C signal with a negative slope and before the subsequent positive going ring synchronous signal.

4,533,793

WALL EXCHANGE

Fritz Geppert, Ober-Moerlen, Fed. Rep. of Germany, assignor to Telefonbau und Normalzeit GmbH, Frankfurt, Fed. Rep. of Germany

Filed Oct. 26, 1982, Ser. No. 436,779
Int. Cl.³ H04M *1/00*
U.S. Cl. 179—99 R **6 Claims**



1. In a wall exchange for telephone systems, particularly key systems, in which a baseplate (1) is fixed to a wall and in the lower portion of said baseplate are connecting strips (3) with multiple contact strips pointing upwards, and having a component holder (7) which has on its backside a wiring card (18) which in its lower end has multiple-plug connectors (19) whereby the component holder is mounted with the multiple-plug connector inserted into the multiple contact strips in a slanted forward direction and, by swinging toward the wall, is attached to the baseplate and further having power supply modules (24, 25, 26) and a housing cover (35), the improvement comprising: each of said power supply modules, component holder, cover and baseplate being made of plastic and including means on said baseplate and on said modules, component holder and cover for making snap-in locking engagement between each of said modules, component holder and cover and said baseplate.

4,533,794

ELECTRODE FOR ELECTROSTATIC TRANSDUCER

Harold N. Beveridge, 1544 Knoll Circle Dr., Santa Barbara, Calif. 93103

Filed May 23, 1983, Ser. No. 497,297
Int. Cl.³ H04R *19/00*
U.S. Cl. 179—111 R **23 Claims**

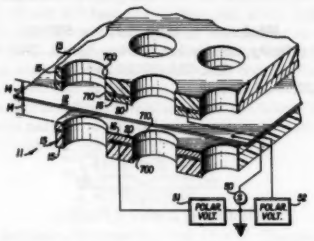
1. An electrode for use in an electrostatic transducer, comprising:

planar nonconductive means having a plurality of first holes;

a conductive layer on a first side of said planar member, said conductive layer having a plurality of second holes; and

a dielectric layer having a volume resistivity of not more

than 10^{13} ohm cm on said first side of said planar member to sandwich said conductive layer between said planar



member and said dielectric layer, said dielectric layer having a plurality of third holes.

4,533,795

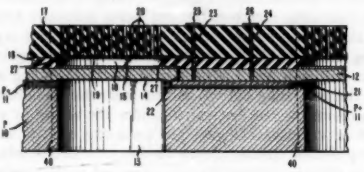
INTEGRATED ELECTROACOUSTIC TRANSDUCER

John C. Baumhauer, Jr.; Harold J. Hershey, both of Indianapolis, Ind., and Tommy L. Poteat, Bridgewater, N.J., assignors to American Telephone and Telegraph, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 7, 1983, Ser. No. 511,640

Int. Cl.³ H04R *7/18*

U.S. Cl. 179—111 E **26 Claims**



1. An electroacoustic transducer formed within a semiconductor substrate comprising

an essentially nontensioned diaphragm comprising a semiconductor material having a mechanical bending moment stiffness such that it vibrates in response to an input signal at audio and/or ultrasonic frequencies; and

a pair of electrodes placed with respect to said diaphragm so that the electric field between the electrodes varies in relationship with the vibrating diaphragm to permit conversion between electrical and acoustic signals.

4,533,796

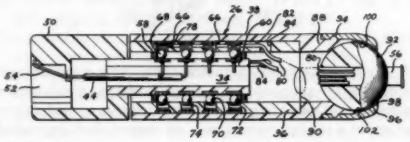
ROTATABLE ELECTRICAL CONNECTOR FOR TELEPHONE CORD

Anthony R. Engelmore, 14001 Harbour Pl., Prospect, Ky. 40059

Filed Jan. 30, 1984, Ser. No. 575,102

Int. Cl.³ H01R *35/00*

U.S. Cl. 179—186 **13 Claims**



1. A low friction rotatable electrical connector for use with telephone cords, said connector comprising:

a. an insulated pair of rotatably interconnected elongated members, there being a hollow inner cylindrical member telescoped within a hollow outer cylindrical member;

b. and a pair of widely spaced, low friction bearing means located on the inner cylindrical member adjacent the opposite ends thereof for supporting the outer cylindrical member therefrom for turning movement about a longitudinal central axis of the connector;

c. the outer end of one rotatable member having a female electrical socket member, while the outer end of the other rotatable member has a male electrical plug member, each of said male and female members being adapted to make electrical connection with a separate set of electrical conductors;

d. a plurality of continuous conductive rings mounted on the exterior of the inner cylindrical member and spaced along the length thereof, and a set of flexible insulated conductors located within the inner cylindrical member and joining each separate conductive ring to the one of the said male and female members that is on the outer end of the inner member;

e. a plurality of split conductive rings mounted on the exterior of the outer cylindrical member to be generally aligned and concentric with the said continuous rings of the inner member, the wall of the outer member being provided with at least one aperture in alignment with each of the plurality of split rings, each aperture being provided with a spring-biased contact member that is in constant electrical contact with one of the said continuous rings of the inner member;

f. the exterior of the outer member having a plurality of longitudinally extending slots, each slot receiving one of a set of flexible insulated conductors, where each conductor is connected at one end to one of the split rings and connected at its other end to the other of said male and female members that is on the outer end of the outer member;

g. and an insulated sleeve fitted over the outer member and held thereon.

4,533,797

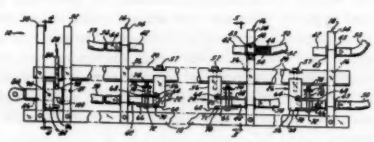
LOW VOLTAGE ROTARY TAP CHANGER

Neil J. Kranich, II, West Allis, and Wallace E. Boivin, Jr., Waukesha, both of Wis., assignors to ASEA Electric, Inc., Waukesha, Wis.

Filed Jun. 7, 1984, Ser. No. 618,264

Int. Cl.³ H01H *21/62*

U.S. Cl. 200—11 TC **11 Claims**



4. A five position, three deck rotary tap changing switch comprising

a base fabricated from flat insulating sheet,

a number of contact decks mounted on said base in a parallel spaced relation,

each deck including a bore and a number of fixed cable rod contacts mounted at equally spaced distances from each other and at equal radial distances from said bore,

a shaft fabricated from standard insulating rod, extending through the bore in each of said decks,

arcuate contact means corresponding to each of said decks and mounted on said shaft for engaging two of said cable contacts on each of said decks,

Geneva gear drive means operatively connected to said shaft for rotating said arcuate contact means in a step by step manner to selectively connect said contact means to said cable contacts,

said Geneva drive means includes

a gear mounted on said shaft and having a number of radially extending slots and a drive plate mounted for rotary motion on said base,

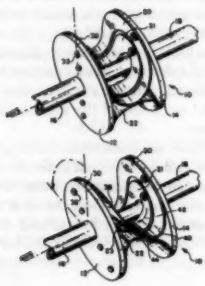
a drive pin mounted on said plate and being positioned to rotate into and out of one of said slots in each revolution of said plate to advance the shaft a predetermined angular distance.

4,533,798

CURRENT TRANSFER SHUNT ARRANGEMENT

Joseph W. Yatchum, McMurray, and David F. Giegel, Pittsburgh, both of Pa., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Jun. 4, 1984, Ser. No. 616,845
Int. Cl.³ H01H *19/00, 1/12*
U.S. Cl. 200—11 R 20 Claims



1. A current transfer shunt, comprising:

(a) a shaft defining an axis of rotation;

(b) base means for rotatably mounting said shaft;

(c) a first support plate carried by said shaft at generally right angles to said axis of said shaft;

(d) a second support plate fixedly carried by said base means and disposed generally parallel to and axially separated from said first support plate; and

(e) at least one generally oval, flat, flexible electrical conductor which when flattened defines two generally parallel and opposite sides and two semi-circular complementary sides disposed between and connected to said two parallel sides, said one conductor being suspended between and connected to said first and second support plates generally at the center of each semi-circular side with the plane of said semi-circular sides disposed generally parallel to and spaced apart from each other and at right angles to said axis of said shaft,

whereby upon rotation of said shaft one end of each semi-circular side is pulled away from one of said first and second support plates and the opposite end is urged against the same support plate.

2. The shunt set forth in claim 1, further including a second generally oval, flat, flexible conductor which when flattened defines two parallel and opposite sides and two semi-circular complimentary sides disposed between and connected to said parallel sides, said second conductor being disposed opposite to said one conductor and being suspended between and connected to said first and second support plates such that the parallel sides of said second conductor are bowed towards and in contact with the parallel sides of said one conductor,

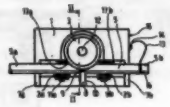
whereby upon rotation of said shaft the parallel sides of said one conductor roll relative to the parallel sides of said second conductor.

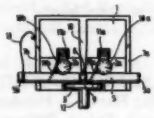
4,533,799

ELECTRIC SAFETY SWITCH WITH REMOVABLE CONDUCTING ROD

Manuel A. Vincent De Araujo, 73390 Chamoux-sur-Gelon, France

Filed Apr. 6, 1984, Ser. No. 597,411
Claims priority, application France, Apr. 8, 1983, 83 06394
Int. Cl.³ H01H *35/14*
U.S. Cl. 200—52 R 9 Claims





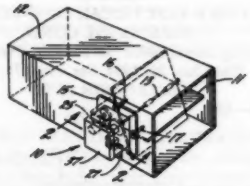
1. In an electric switch comprising an insulating case supporting two electric terminals and a removable conducting rod intended to come into abutment against the terminals so as to establish an electric contact and comprising an extension forming an operating member, the rod being normally held in a stable abutment position, pushed by a retaining piece urged by a spring and operable by means of a resetting lever, against the electric terminals and against a case portion forming a fixed guide, the rod being able to escape from the retaining piece after a reversible resilient travel, under the action of a force applied to its extension and thus open the electric contact, auxiliary electric conductors are further provided in which the auxiliary electric conductors are connected to the conducting terminals and remain in contact with the rod during its reversible resilient travel so as to maintain the electric contact until the rod escapes the retaining piece.

4,533,800

REVERSIBLE ROTARY ACTUATOR

Gerald R. Parsons, Poplar Grove, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Dec. 9, 1983, Ser. No. 559,716
Int. Cl.³ H01H *3/16*
U.S. Cl. 200—61.39 10 Claims



1. A reversible rotary actuator comprising a mounting base adapted to be anchored in a fixed position, a sub-base supported on said mounting base to turn relative to said mounting base about a predetermined axis, an output shaft journaled by said mounting base to rotate relative to said mounting base and said sub-base, a reversible electric motor carried by said sub-base and selectively operable to drive said output shaft either clockwise or counterclockwise, first and second normally

closed switch means which are operable when opened to prevent energization of said motor in clockwise and counterclockwise directions, respectively, and stop means fixed to said mounting base for opening said first switch means in response to turning of said sub-base in one direction about said axis and for opening said second switch means in response to turning of said sub-base in the opposite direction about said axis, each of said switch means comprising one switch contact fixed to said sub-base and further comprising an additional switch contact having one portion fixed to said sub-base and having a cantilevered portion adapted to flex between open and closed positions relative to said one portion.

4,533,801

INERTIA SWITCH DEVICE

Peter R. Jackman, Basingstoke, and Alan D. Thomas, Reading, both of England, assignors to First Inertia Switch Limited, England

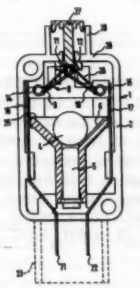
PCT No. PCT/GB82/00347, § 371 Date Jul. 26, 1983, § 102(e) Date Jul. 26, 1983, PCT Pub. No. WO83/02196, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 8, 1982, Ser. No. 522,154

Claims priority, application United Kingdom, Dec. 15, 1981, 8137716

Int. Cl.³ H01H *35/14*

U.S. Cl. 200—61.45 R **11 Claims**



1. An inertia switch device comprising:

an inertia mass (4) which is movable from a rest position when the device is subjected to an applied acceleration exceeding a threshold value;

spaced electrical contact means (16 and 17, and 31 and 32);

a hinge-like assembly (8) which is mounted independently of the inertia mass (4) and in which two parts (9 and 10) are connected for movement between two over-centre positions on opposite sides of a centre position in which the two parts (9 and 10) are aligned with a common plane, in response to movement of the inertia mass (4) when subjected to said applied acceleration; and

movable electrical contact means (14 and 15) on at least part of the hinge-like assembly (8) and arranged to engage the spaced electrical contact means (16 and 17, and 31 and 32) when the hinge-like assembly (8) is in one of the over-centre positions;

characterized in that:

the spaced electrical contact means (16 and 17, and 31 and 32) comprise two first contacts (16 and 17);

the movable electrical contact means comprise two electrically connected movable contacts (14 and 15);

the hinge-like assembly (8) is mounted independently of the spaced electrical contact means (16 and 17, and 31 and 32) so that the movable contacts (14 and 15) are respectively movable into and out of contact with the two first contacts (16 and 17) so as to bridge the first two contacts (16 and 17); and

resilient biasing means (26 or 41) are operable, on said movement of the inertia mass (4), to move the hinge-like assembly (8) from said one of the overcentre positions, in which the movable electrical contacts (14 and 15) engage the first electrical contacts (16 and 17, and 31 and 32), to the other of the over-centre positions, and are operable to releasably hold the hinge-like assembly (8) in said other of the overcentre positions.

4,533,802

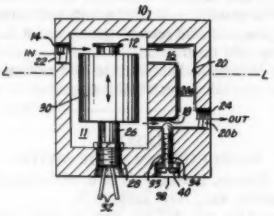
LIQUID FLOW SWITCH AND METHOD OF USING SAME

Peter S. Spalding, Martville, N.Y., assignor to Alcan Aluminun Corporation, Cleveland, Ohio

Filed Jun. 12, 1984, Ser. No. 619,851

Int. Cl.³ H01H *35/38*

U.S. Cl. 200—81.9 R **8 Claims**



1. A liquid flow switch comprising

(a) structure defining a chamber for liquid and having an inlet for introducing a flow of liquid to an upper level of the chamber, an outlet for discharging a flow of liquid from an upper level of the chamber, and an orifice of restricted cross-section for bleeding liquid from the chamber at a level below the inlet and outlet, such that when the flow rate of liquid through the inlet exceeds the bleed rate of liquid through the orifice the liquid level in the chamber rises to and remains at least at the level of said outlet, and when said bleed rate exceeds said inlet flow rate the liquid level in the chamber falls; and

(b) switch means, responsive to change of liquid level in the chamber, for producing a signal when the liquid level passes in at least one direction through a predetermined level in the chamber intermediate the level of said outlet and the level of said orifice.

4,533,803

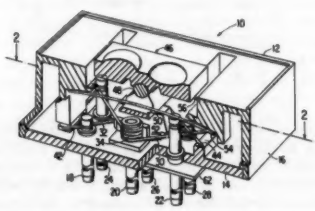
SWITCH CONSTRUCTION

Wilbert E. Beller, Park Ridge; George D. Georgacakis, Skokie, and George Obermann, Niles, all of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Oct. 17, 1983, Ser. No. 542,865

Int. Cl.³ H01H *21/24*

U.S. Cl. 200—153 K **9 Claims**



1. A construction for a switch comprising:

a housing;

a plurality of electrically conductive terminal posts extending into said housing;

an electrically conductive torsion spring element having a central helical portion and first and second ends extending therefrom, said central helical portion being mounted on a first one of said posts and said first and second ends being biased toward contact with a second and a third of said posts, respectively;

an actuator mounted for pivoting movement is said housing, said actuator being arranged so that

(a) when said actuator is in a neutral position said first spring end contacts said second post and said second spring end is held from contacting said third post;

(b) when said actuator is pivoted to one side of said neutral position said first spring end is held from contacting said second post and said second spring end contacts said third post; and

(c) when said actuator is pivoted to the other side of said neutral position said first spring end contacts said second post and said second spring end is held from contacting said third post;

means for biasing said actuator to said neutral position; and means for providing electrical connections to said posts.

4,533,804

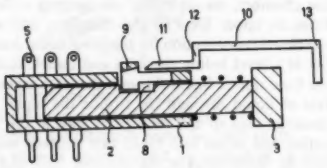
PUSH BUTTON SLIDE SWITCH

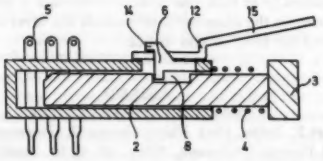
Peter K. G. Kramer, Berlin, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

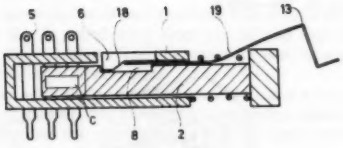
Continuation of Ser. No. 946,358, Sep. 27, 1978, abandoned. This application Mar. 27, 1981, Ser. No. 248,321

Int. Cl.³ H01H *13/52, 3/12*

U.S. Cl. 200—159 R **5 Claims**







1. A push button slide switch in which fixed contacts are arranged in an elongated housing of insulated material, and in which a slider carrying movable contacts is longitudinally movably mounted, and in which a tongue-like movable retaining member is molded thereto in a cutout of the housing wall, with the retaining member engaging said slider in a generally rectangular cutout therein; wherein said fixed contacts are arranged in two transversely spaced and longitudinally extending rows along said housing with said fixed contacts extending through said housing in a direction substantially perpendicular to the longitudinal direction and projecting away from at least one side of said housing, wherein the transverse width of said retaining member is less than the transverse spacing between said rows of fixed contacts and said retaining member is provided with a longitudinally inwardly facing positive stop surface for limiting the outward translation of said slider by rigidly engaging a longitudinally outwardly facing wall portion of said generally rectangular cutout, wherein substantially all of the stop force components when said stop surface engages said wall portion are transmitted solely in the longitudinal direction thereby to retain said retaining member in said generally rectangular cutout, and wherein by the direct application of an external force to said retaining member in a direction substantially perpendicular to said longitudinal direction said retaining member is deflectable away from said rectangular cutout so that said positive stop surface can be deflected away from engagement with said wall portion to permit removal of said slider from said housing, and wherein the retaining member is provided with a tool engaging surface which is spaced-apart from the surface portion of said slider within said rectangular cutout and which generally faces said slider, said retaining member being arranged so that it can be lifted and deflected upwardly by means of a flat tool which is insertable with respect to said switch adjacent the wall of the housing carrying the retaining member for engaging said tool engaging surface.

4,533,805

MANUAL OPERATING DEVICE FOR A SLIDE TYPE ELECTRICAL DEVICE

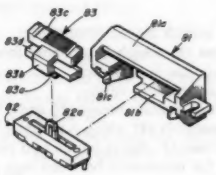
Yoshio Fujinami, Hachioji; Katumi Itoyama, Hino, and Hiroshi Ochiai, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

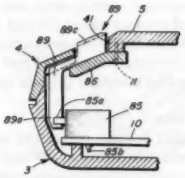
Filed Nov. 2, 1983, Ser. No. 548,151

Claims priority, application Japan, Jun. 28, 1983, 58-98784[U]; Jun. 29, 1983, 58-100480[U]

Int. Cl.³ H01H *9/04, 15/24*

U.S. Cl. 200—304 **11 Claims**





1. A manual operating device for a slide type electrical device in an electrical apparatus, said electrical apparatus including a housing having a hole, and said slide type electrical device having an actuating slide, said manual operating device comprising:

a cover plate securely attached to the inside of said housing and positioned adjacent to said hole, said cover plate having an area larger than said hole and said housing

having a cut-away portion along said hole to form a slide slot between said cover plate and said housing; and

a manual operating slide having an operating plate and a connecting arm extending through said slide slot to connect said operating plate to said actuating slide of said slide type electrical device.

4,533,806

METHOD OF MANUFACTURING BIMETALLIC TUBES

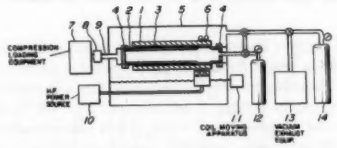
Tatsuo Kawasaki; Isao Takada, both of Chiba, and Hiroshi Ohtsubo, Ichikawa, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jun. 1, 1982, Ser. No. 383,733

Claims priority, application Japan, Jun. 11, 1981, 56-88797; Dec. 25, 1981, 56-209046

Int. Cl.³ H05B 5/00, 6/00

U.S. Cl. 219—8.5 **6 Claims**



1. In a method of manufacturing bimetallic tubes by inserting an inner tube into an outer tube, filling a solder material in a space defined between the inside of said outer tube and the outside of said inner tube, and zone-heating the resulting tube assembly by applying heat from a heating unit to each part of the tube assembly, while pressurizing the inside of said inner tube with a gas, so as to effect brazing of said inner tube to said outer tube, the improvement which comprises placing a flux with said solder material in the space between the inside of said outer tube and the outside of said inner tube, while the zone-heating and pressurizing of said tube assembly takes place moving the heating unit over the whole length of said tube assembly so as to expand both the tubes and cause the flux to successively melt and move out of the space between the tubes, effecting brazing of said inner tube to said outer tube.

4,533,807

COOKING UTENSIL FOR INDUCTION COOKING APPARATUS

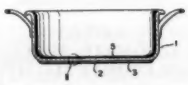
Ataru Minamida, Higashi-Murayama, Japan, assignor to Asahi Kogyo Kabushiki Kaisha, Tokyo, Japan

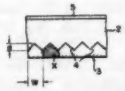
Continuation of Ser. No. 402,849, Jul. 29, 1982, abandoned. This application Mar. 5, 1985, Ser. No. 708,102

Claims priority, application Japan, Apr. 27, 1982, 57-69569

Int. Cl.³ H05B 6/12

U.S. Cl. 219—10.49 R **2 Claims**





1. A cooking utensil for use with induction heating cooking apparatus, comprising:

an aluminum or aluminum alloy utensil body, and a magnetic substance layer provided at at least the outer surface of said utensil body at the bottom thereof;

the interface between said magnetic substance layer and said utensil body, being comprised of a plurality of concave and convex faces defined by a series of successive adjacent V-shaped internesting portions at the respective adjoining surfaces of said magnetic substance layer and said utensil body;

said utensil body having a flat inwardly directed cooking surface which is coated with a flourine-containing resin; and

the said magnetic substance layer being comprised of iron sprayed to the said outer surface of said bottom of said utensil body.

4,533,808

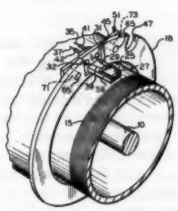
AN INDUCTION YARN HEATER DEVICE

John E. Newman, Spartanburg County, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 28, 1983, Ser. No. 566,464

Int. Cl.³ H05B 6/14

U.S. Cl. 219—10.49 A **9 Claims**



1. An apparatus consisting essentially of

a base having a rotatable shaft,

a rotatable roll having a front end and a back end and an inner surface, wherein said heater is attached to said base and positioned between said rotatable shaft and said inner surface of said rotatable roll,

a plate having an interior face and an exterior face wherein said plate is attached to said base adjacent to the back end of said heater and extends radially outward with respect to said rotatable shaft, and wherein said interior face of said plate is positioned adjacent to the back end of said rotatable roll,

a temperature sensing means, and

a support means attached to said base and supporting said temperature sensing means in close proximity to said inner surface of said rotatable roll and said outer surface of said heater; wherein said support means comprises:

a first piece having a face side and a back side,

a second piece having a face side and a back side; wherein said first and second pieces are joined together in perpendicular orientation to one another such that said face side of said first piece and said face side of said second piece face the interior of the right angle defined by the joinder of said first and second pieces; wherein said second piece has a depression on the face said which extends from the end opposite the end where said first and said second pieces and joined, and extends toward the end where said first and said second pieces are joined; and wherein said face side of said first piece is brought into contact with said exterior face of said plate and attached to said exterior face in a manner to premit removal of said support means; and, wherein said temperature sensing means can be removed from said close proximity to said inner surface of said rotatable roll, without disassembling said rotatable roll from said rotatable shaft.

4,533,809

MICROWAVE OVENS AND METHODS OF COOKING FOOD

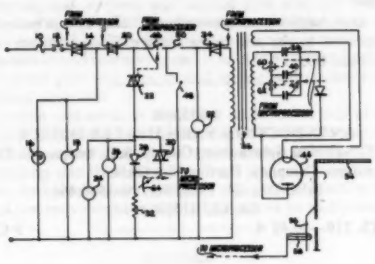
Kenneth I. Eke, Sanderstead, England, assignor to Microwave Ovens Limited, Surrey, England

Filed Mar. 12, 1984, Ser. No. 588,336

Claims priority, application United Kingdom, Mar. 15, 1983, 8307123

Int. Cl.³ H05B 6/68

U.S. Cl. 219—10.55 M **8 Claims**



1. A method of cooking food in a microwave oven having an oven cavity and a door for closing the cavity, comprising starting with the cavity of the oven in a cold condition, placing a food item into the cavity and closing the door, commencing a cooking process by applying to the food item continuous microwave power and simultaneously continuous thermal power by blowing a forced flow of hot air through the cavity, timing the cooking process from the commencement thereof, monitoring the temperature within the cavity or a function of said temperature, and ceasing the cooking process by ceasing the microwave power and the thermal power if the cavity temperature, or the function thereof, reaches a predetermined level within a predetermined time, continuing the cooking process with an increased level of microwave power and a decreased level of thermal power if the predetermined temperature is not reached within the predetermined time and ceasing the production of the microwave power at the increased level and the thermal power at the decreased level if the cavity temperature drops below a predetermined sub-level, lower than the predetermined level, after a further preset delay.

4,533,810

START CIRCUIT FOR MICROWAVE OVEN

Larry R. Harmon, Louisville; John C. Reiche, Middletown; Howard R. Bowles, and Norman H. Chiu, both of Louisville, all of Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 20, 1984, Ser. No. 642,567

Int. Cl.³ H05B 6/68

U.S. Cl. 219—10.55 B **4 Claims**

1. A start circuit arrangement for a microwave oven of the type having a cooking cavity with an access door, and enabling the user to select a plurality of operating modes including a time delay mode in which start of a cooking cycle is delayed by an amount of time selected by the user, said circuit comprising:

an electronic controller operative to control cyclical operation of the oven; said controller including timer means for controlling the duration of cooking cycles and delay times in accordance with user selections;

microwave generating means adapted for selective energization by an external power supply;

a power control relay operative in a first operating condition to enable energization of said microwave generating means by said external power supply and in a second operating condition to prevent energization of said microwave generating means;

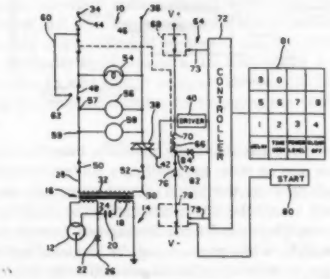
a user actuable momentary start switch;

a bistable electronic start latch means operative in its first state to enable said first operating condition for said relay and operative in its second state to establish said second operating condition for said relay; said latch means including a first input coupled to said start switch and a second input coupled to said electronic controller; said latch means being operative to assume its first state in response to user actuation of said start switch and to assume its second state in response to a reset signal from said electronic controller;

a door switch operative to assume a first state when the access door is closed and a second state when the access door is open;

means for providing a door signal to said controller, said signal having a first state and a second state and said means being operative to switch said signal to its first state when the door is closed and said latch is in its first state, and to its second state otherwise;

electronic arm switch means having a first state and a second state and operative in its first state to enable said first



operating condition for said relay and operative in its second state to establish said second operating condition for said relay, said arm switch means assuming its first state in response to an arm signal from said electronic controller; said controller being operative to generate said arm signal upon expiration of the user selected time delay to initiate a cooking cycle and to remove said signal upon expiration of the user selected cooking cycle time to terminate the cooking cycle;

said arm switch means, said latch means and said door switch means being operatively coupled in circuit with said relay such that said first operating condition for said relay is only established when each of said arm switch, said door switch, and said latch means is in its first state;

whereby the selected time delay period is initiated by user actuation of said momentary start switch and energization of microwave energy source is enabled by said arm signal from said controller at the expiration of the time delay period to initiate the subsequent cooking cycle.

4,533,811

METHOD FOR AUTOMATIC PROCESS CONTROL IN SPARK EROSIVE MACHINING

Ernst Bühler, Losone, Switzerland, assignor to AG fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

PCT No. PCT/CH82/00002, § 371 Date Sep. 2, 1982, § 102(e) Date Sep. 2, 1982, PCT Pub. No. WO82/02353, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 12, 1982, Ser. No. 420,230

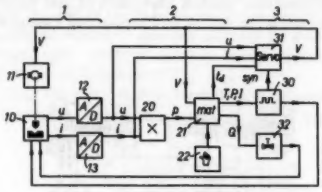
Claims priority, application Switzerland, Jan. 13, 1981, 190/81

Int. Cl.³ B23P 1/08

U.S. Cl. 219—69 M **14 Claims**

1. Method for automatic process control of a spark erosion

machine having a spark gap defined by a tool surface and a work piece surface under varying process conditions in the spark gap caused by changes of the area of the work piece surface to be machined and wherein the power at the spark gap during the erosion process is adjustable in response to a change in at least one process parameter, said method comprising the steps of adjusting a relative feed rate between said tool and work piece surfaces in response to a servo-control system so



that erosion takes place with a predetermined average ignition delay; providing a value of the electrical power at the spark gap; calculating a predetermined linear combination of the logarithm of the feed rate and the logarithm of the power to form a value for the actual machining intensity; providing a value for a desired machining intensity; comparing the values of actual and desired maching intensity; and controlling at least one process parameter to bring the actual machining intensity into conformity with the desired machining intensity.

4,533,812

METHOD AND DEVICE FOR FINE PROFILING TOOLS COATED WITH SUPER-HARD MATERIALS

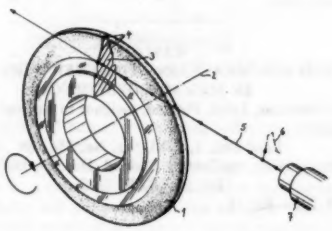
Manfred Lorenz, Coburg, Fed. Rep. of Germany, assignor to Kapp & Co. Werkzeugmaschinenfabrik, Coburg, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,157

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202697

Int. Cl.³ B23K *26/00*

U.S. Cl. 219—121 LH **9 Claims**



1. A method of precision profiling a tool which is coated with a super-hard material and has a prescribed outer contour, including a cutting surface, with some of the tips of the crystals of said coating projecting beyond said prescribed outer contour prior to said precision profiling; said method including the steps of:

rotating said tool;

generating a focused high energy beam;

orienting said beam tangential to said tool; and

moving said beam in a controlled path which corresponds to said prescribed outer contour of said tool to thereby profile said tool in the region of said cutting surface thereof by vaporizing said crystal tips which project beyond said prescribed outer contour.

4,533,813

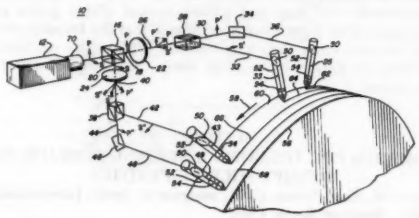
OPTICAL SELECTIVE DEMETALLIZATION APPARATUS

Charles C. Rayburn, Lynchburg, Va.; Howard R. Padgitt, Park Ridge, and Henry J. Flair, Franklin Park, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 6, 1983, Ser. No. 529,304

Int. Cl.³ B23K *26/00*

U.S. Cl. 219—121 LH **8 Claims**



1. An apparatus for applying optical energy to selectively remove a plurality of lanes of metal film carried upon a substrate; said apparatus comprising optical generation means for generating a primary beam in a primary beam path; beam expander means in said beam path for diffusing said primary beam to produce an expanded beam in an expanded beam path substantially coaxial with said primary beam path; partitioning means for dividing said expanded beam into a plurality of derivative beams; reflective means for redirecting each of said plurality of derivative beams to form a plurality of working beams which impact the substrate; transport means for transporting the substrate in a direction transverse of said plurality of working beams; and focusing means for focusing each of said plurality of working beams upon the substrate, said focusing means comprising a plurality of lens means configured to focus each of said plurality of working beams upon the substrate in a substantially elliptical pattern, the major axis of said substantially elliptical pattern being substantially aligned with said direction of transport of the substrate.

4,533,814

LASER PIPE WELDER/CUTTER

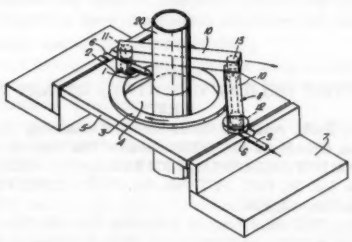
Brooke A. Ward, Goring on Thames, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 31, 1983, Ser. No. 462,475

Claims priority, application United Kingdom, Feb. 12, 1982, 8204249

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LD **3 Claims**



1. A laser processing apparatus comprising, a focusing head which is mounted on a carriage which is adapted to follow a closed path around a position at which a stationary workpiece to be processed by a laser beam may be placed whilst maintaining the laser beam at normal incidence to the workpiece and

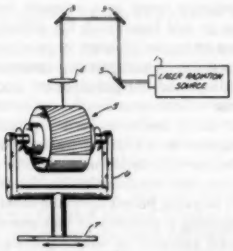
bringing it to a focus at the surface of the workpiece, a flexible laser beam guide connecting the focusing head to a stationary laser beam guide, the flexible laser beam guide including at least three optical elbow joints each having an angular movement of more than two hundred and seventy degrees and means for reflecting the laser beam from one optical elbow joint to another and thence to the focusing head, a first of the optical elbow joints being associated with the focusing head, a second of the optical elbow joints being associated with the fixed laser beam guide and the third optical elbow joint being intermediate the first and second optical elbow joints and separated from them by distances such that the focusing head can traverse more than a full circuit around the workpiece without the flexible beam guide coming into contact with the workpiece.

4,533,815

PROCESS FOR TREATING A BEARING SURFACE TO MODIFY MICROASPERITIES

Gunes M. Ecer, Irvine, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Aug. 1, 1983, Ser. No. 518,921
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LF **13 Claims**



1. A process for treating a bearing surface for elastohydrodynamic lubrication, the bearing surface having microasperities for retaining lubricant, which comprises:

generating a high density energy beam; and

producing relative motion between the beam and the bearing surface to define a succession of points at each of which the beam impinges upon the bearing surface for an interaction time during which localized heating occurs and then rapid cooling begins to cause partial melting followed by rapid solidification that, in the direction normal to the bearing surface extends to a depth less than the microasperity height and that, owing to said relative mmotion, extends throughout an area of the bearing surface to define a microdimpled surface having rounded microasperities with residual compressive stress for retaining lubricant and enhancing resistance to wear and fatigue.

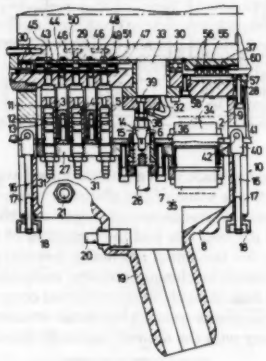
4,533,816

ELECTRIC WELDING GUN WITH A ROTARY TORCH HEAD

Holger Roeh, Adalbert-Stifter-Str. 1, Germering, and Josef Geiss, Otto-Hahn-Str. 1, Haar, both of Fed. Rep. of Germany

PCT No. PCT/DE81/00131, § 371 Date Apr. 26, 1982, § 102(e) Date Apr. 26, 1982, PCT Pub. No. WO82/00787, PCT Pub. Date Mar. 18, 1982
PCT Filed Aug. 28, 1981, Ser. No. 375,288
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032696
Int. Cl.³ B23K *9/28, 9/02*
U.S. Cl. 219—137.31 **17 Claims**

1. An electric welding gun comprising: a rotary driving shaft in an outer casing provided with a supporting casing for handling the welding gun; a plurality of supply lines jointly introduced into the supporting casing, said plurality of supply lines comprising liquid and gas lines including a cooling water feed line, a cooling water return line and an inert gas feed line; means for conducting the output of each supply line into a respective axially sealed ring chamber in the outer casing for supplying line ducts formed in the rotary driving shaft, said plurality of supply lines further comprising a welding current line connected to a current transfer means for transferring welding current to the shaft made of electrically conductive material and electrical control lines, each of said supply lines having a line coupling within said supporting casing wherein



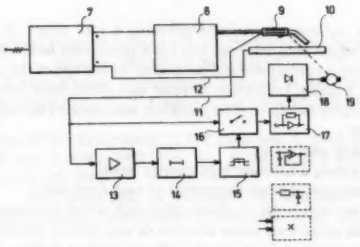
each of said line couplings is a plug connection and said supporting casing is subdivided into a plug box and a socket box adapted to be assembled to form the supporting casing and to be locked together in the assembled arrangement by a locking mechanism, said plug connections extending parallel to each other and each of said plug connections comprising two coupling parts, one fixed to said plug box and the other fixed to said socket box, whereby the said plug box and socket box cooperate to form a multi-point connector in such a way that said two coupling parts of each of said plug connections are commonly assembled by said assembling of the plug box and the socket box.

4,533,817

METHOD FOR MEASURING THE FREE WIRE LENGTH IN MIG/MAG WELDING

Tapani Mäkimaa, Lahti, Finland, assignor to Kemppi Oy, Lahti, Finland

Filed Dec. 1, 1983, Ser. No. 556,909
Claims priority, application Finland, Dec. 29, 1982, 824500
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—137.71 **7 Claims**



1. A method for automatically controlling the free wire

length extending from the gun of welding apparatus during a welding process, such as hot-arc, short-arc and MIG/MAG welding, said method comprising

detecting a first time instant when the voltage over the arc achieves a minimum, said minimum indicating the beginning of a bead short-circuit situation;

measuring the voltage at at least one selected time point in the interval between said first time instant and a second time instant when the voltage over the arc, subsequent to said minimum, achieves a maximum, said maximum indicating the end of the bead short-circuit situation;

producing an electrical quantity affected by said measured voltage, said electrical quantity being representative of said free wire length; and

controlling the gun to maintain said free wire length substantially constant in response to said electrical quantity.

4,533,818

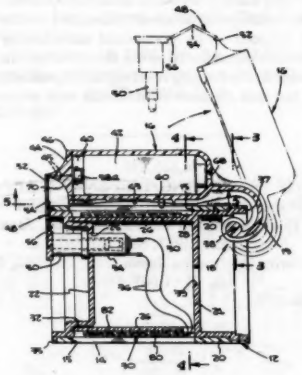
ELECTRIC HAIR CURLER WITH SELF-CONTAINED BATTERY POWER SUPPLY

Sara Green, 340 S. Kenmore, #205, Los Angeles, Calif. 90020

Filed Feb. 16, 1983, Ser. No. 466,842

Int. Cl.³ A45D *2/36*; H05B *3/02*

U.S. Cl. 219—222 **11 Claims**



1. A self powered heated hair curling roller comprising, in combination:

a roller body;

a hair retaining clamp pivotably attached at one end to said roller body and pivotable between an open position in which the free end of the clamp is spaced from said roller body to allow hair to be wound on said roller body and a closed position wherein said free end is nearest said roller body to clamp the hair wound on the roller body;

electrical heater means associated with said roller body for heating said roller body;

a battery compartment defined within one of said roller body or said clamp;

cooperative separable connector means on said clamp and roller body for operatively electrically interconnecting a battery in said battery compartment and said heater means; and

said connector means also operating as a mechanical fastener for securing said free end of said clamp to said roller body in said closed position such that the electrical connection is interrupted upon release of said clamp.

4,533,819

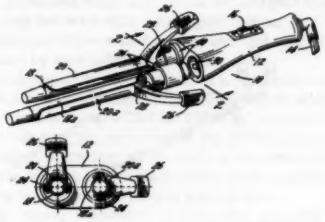
DUAL MANDREL ELECTRIC CURLING IRON WITH SEPARATE ANGULARLY ADJUSTABLE HAIR CLAMPS

Mary M. Valiulis, 735 Napoleon, Rockford, Ill. 61103

Filed Jul. 2, 1984, Ser. No. 627,078

Int. Cl.³ A45D *1/02*; H05B *3/02*

U.S. Cl. 219—225 **6 Claims**



1. A device for curling hair, said device comprising an elongated handle, a pair of elongated winding mandrels extending from one end of said handle in spaced side-by-side relation, means for heating said mandrels, a separate, independently operable hair clamp movably connected to and extending alongside each of said mandrels, and means connecting said mandrels to said one end of said handle with the clamp of one of the mandrels at a different angular orientation relative to the longitudinal axis of said handle than the clamp of the other mandrel.

4,533,820

RADIANT HEATING APPARATUS

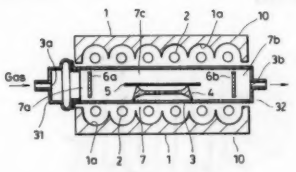
Hiroshi Shimizu, Yokohama, Japan, assignor to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 480,015

Claims priority, application Japan, Jun. 25, 1982, 57-108533

Int. Cl.³ C23C *13/08*; F27D *11/02*; F27B *5/16*

U.S. Cl. 219—411 **1 Claim**



1. A radiant heating apparatus comprising:

a container having a wall, said container being adapted to position an item to be heated therein, at least one part of said container being transparent;

a heat-radiating lamp irradiating light onto said item through the transparent part of said container;

a gas inlet and gas outlet formed through the wall of said container; and

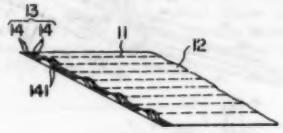
means for maintaining uniformly dispersed gas flow across said container where the item is positioned, said uniform gas flow maintaining means including a gas flow dispersion barrier made of material transparent to said irradiated light, whereby the barrier does not become heated, and disposed within said container so as to substantially confront said gas inlet, said gas flow dispersion barrier defining a plurality of gas through-holes.

4,533,821

HEATING SHEET

Ryoda Sato, 8-25 Obamacho 1-chome, Amagasaki-shi, Hyogo-ken, Japan (661)

Filed Sep. 15, 1983, Ser. No. 532,407
Claims priority, application Japan, Dec. 11, 1982, 57-216283
Int. Cl.³ H05B *3/34*
U.S. Cl. 219—545 12 Claims



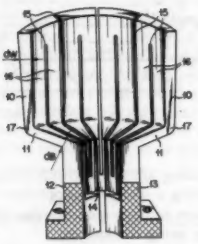
1. A heating sheet, comprising: a nonconductive fiber sheet; a plurality of heating wires fixed on at least one surface of said nonconductive fiber sheet and extending in a longitudinal direction so that said plurality of heating wires do not cross each other; and at least two common power source terminals each having a plurality of conductors fixed on at least said one surface of said nonconductive fiber sheet and extending in a transverse direction, each of said common power source terminals being connected to a corresponding or intermediate portion of a plurality of said heating wires such that each of said plurality of conductors crosses and is electrically connected to a corresponding plurality of heating wires, each of said common power source terminals having arcuate portions extending above or below said non-conductive fiber sheet at predetermined intervals; and means for connecting said common power source terminals to a low-voltage power source

4,533,822

HEATING RESISTOR OF SINGLE CRYSTAL MANUFACTURING APPARATUS

Takashi Fujii; Jisaburo Ushizawa, and Masayuki Watanabe, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 22, 1984, Ser. No. 592,363
Claims priority, application Japan, Mar. 25, 1983, 58-48746
Int. Cl.³ H05B *3/10*
U.S. Cl. 219—553 6 Claims



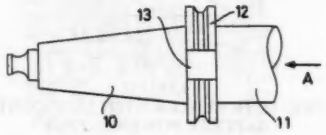
1. A heating resistor of a single crystal manufacturing apparatus which has a structure such that a cylindrical side wall portion for coaxially surrounding a melting pot, a bottom portion for supporting said side wall portion, and a cylindrical portion which supports said bottom portion and which is connected to power supply electrodes are integrally formed, and a plurality of slits are formed extending along said side wall portion and said bottom portion such that said heating resistor is formed to constitute a heating conductor which is connected from one of said power supply electrodes to the other of said power supply electrodes in a zigzag manner, wherein said bottom portion has a maximum thickness which is not greater than that of said side wall portion, and said bottom portion has a minimum inner diameter which falls within a range of 20 to 80% of an inner diameter of a lowermost portion of said side wall portion.

4,533,823

CODING SYSTEMS FOR ELEMENTS OF MACHINE TOOLS, PARTICULARLY OF THE NUMERICALLY CONTROLLED TYPE

Corni Vittorio, Modena, Italy, assignor to Comau S.p.A., Grugliasco, Italy

Filed Jan. 11, 1983, Ser. No. 457,277
Claims priority, application Italy, May 12, 1982, 67624 A/82
Int. Cl.³ G06F *15/20*
U.S. Cl. 235—375 6 Claims



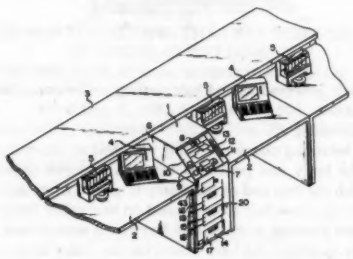
1. A storage system for elements of machine tools, particularly of the numerically controlled type, comprising means (15) for storing a plurality of different said elements, a different "bar" code (14) carried by each different element, a reading head (17) for reading the different codes, and a code detection sensor (18) adapted to be juxtaposed successively with the various different elements to sense the code on the elements and to transmit to the reading head signals representative of the identity of the said element with which said sensor is juxtaposed.

4,533,824

AUTOMATIC DEPOSITING/DISPENSING APPARATUS

Yoshihiro Watanabe, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 9, 1983, Ser. No. 502,728
Claims priority, application Japan, Jun. 16, 1982, 57-103334
Int. Cl.³ G06F *15/30*
U.S. Cl. 235—379 7 Claims



1. An automatic depositing/dispensing apparatus which stores deposited notes together with previously stored notes and appropriates the deposited notes for dispensation, comprising:

a housing having a note inlet and a note outlet;

a plurality of note storage means in the housing each storing deposited notes of a denomination;

first conveyor means for transferring notes inserted in the note inlet to the individual note storage means; and

second conveyor means for transferring to the note outlet notes taken out of the individual note storage means,

each said note storage means including

a note storage chamber into which notes are collected in one direction,

collection/takeout means disposed at one end portion of the note storage chamber, whereby the deposited notes from the first conveyor means are led and collected into the note storage chamber, and the notes collected in the note storage chamber are taken out and delivered to the second conveyor means,

partitioning means capable of selectively assuming a first posture to engage both side edges of the notes stored in the note storage chamber or a second posture removed from the side edges, and movable between a first position inside the note storage chamber and a second position adjacent to the collection/takeout means, so that a temporary storage space is defined between the collection/takeout means and the partitioning means in the first posture and in the first position, and

drive means holding the partitioning means in the first posture and in the first position at the time of deposition to keep the deposited notes in the temporary storage space, and shifting the partitioning means to the second posture and the second position and then to the first posture and the first position in taking out the deposited notes kept in the temporary storage space, and shifting at dispensation the partitioning means to the second posture and the second position.

4,533,825

BAR CODE RECOGNITION APPARATUS

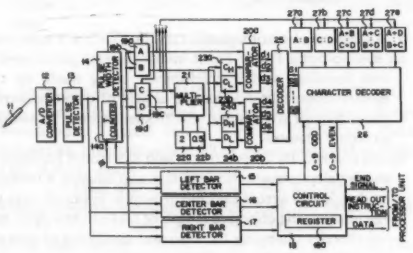
Shigeru Yamada, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,483

Claims priority, application Japan, Jun. 23, 1982, 57-108137

Int. Cl.³ G06K *7/10*

U.S. Cl. 235—463 **6 Claims**



1. A bar code recognition apparatus, comprising:

means for reading a width value of each of four bars of two kinds presented alternately on a medium, to represent one character;

memory means connected to said reading means for storing said width values of said four bars for each character read by said reading means;

calculation means for calculating and producing two width values respectively smaller and greater than that of one of the two bars of a first kind, and two width values respectively smaller and greater than that of one of the two bars of a second kind;

first comparison means, connected to said memory means and said calculation means, for comparing said smaller and greater width values of the bar of the first kind with the width value of the other bar of the first kind and for generating, according to the result of the comparison, a first, a second, or a third width value amplitude comparison signal for the first kind of bars, said first width value amplitude comparison signal being generated when said width value signal for a read individual bar is a width value signal indicative of a still greater width than said greater width provided by said calculation means, said second width value amplitude comparison signal being generated when said width value signal for a read individual bar is a width value signal indicative of a still smaller width than said smaller width provided by said calculation means, said third width value amplitude comparison signal being generated when said width value signal for a read individual bar is a width value signal indicative of a width intermediate between said greater and said smaller widths provided by said calculation means;

second comparison means, connected to said memory means and said calculation means, for comparing the smaller and greater width values of the bar of the second kind with the width value of the other bar of the second kind, and for generating, according to the result of the comparison, the first, the second, or the third width value amplitude comparison signals for the second kind of bars;

decoding means connected to said first and said second comparison means for combining said width value amplitude comparison signals produced from said first comparison means with said width value amplitude comparison signals produced from said second comparison means to produce nine combination signals of said width value amplitude comparison signals;

ratio calculation means connected to said memory ans for calculating a ratio value from the width values of said read individual bars read out from said memory means; and

means, connected to said decoding means and said ratio calculation means, for determining a corresponding character on a basis of one of said combination signals of said width value amplitude comparison signals derived from said decoding means and said ratio value of various width values calculated by said ratio calculation means.

4,533,826

OPTO-ELECTRONIC FOCUSING-ERROR DETECTION DEVICE

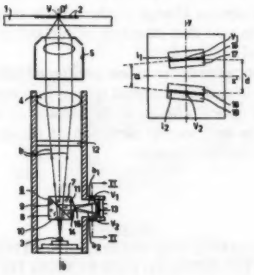
Antonius A. M. van Alem, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1982, Ser. No. 411,734

Claims priority, application Netherlands, May 19, 1982, 8202058

Int. Cl.³ G01J *1/20*

U.S. Cl. 250—201 **6 Claims**



1. A focusing error detection device for detecting deviation between a radiation-reflecting surface and a plane of focusing of an objective system arranged to converge a beam of radiation to a spot on said reflecting surface, said device comprising a beam splitter disposed in the path of radiation reflected by said surface, said beam splitter being arranged so as to form a pair of subbeams from the reflected radiation incident thereon, a detection system disposed in the path of said subbeams, said detection system comprising a plurality of radiation sensitive detectors each having an output for supplying an electrical

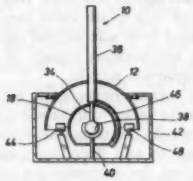
signal, said detectors being separated from each other by a first and second elongated strip, said first elongated strip being associated with one of said subbeams and being inclined at an acute angle with respect to said second strip which is associated with the other subbeam of said pair of subbeams, and an electronic circuit coupled to said outputs of said detectors for deriving a focusing error signal indicative of the deviation between said radiation-reflecting surface and said plane of focusing from said electrical signals supplied by said detectors.

4,533,827

OPTICAL JOYSTICK

Jeffrey L. Fincher, Spring, Tex., assignor to Texas A&M University, College Station, Tex.

Filed Oct. 6, 1982, Ser. No. 433,006
Int. Cl.³ H01J 40/14
U.S. Cl. 250—211 K **19 Claims**



1. An optical joystick converting the variable physical position of a command control to electrical output, comprising:

a command control adapted for tilting from its neutral position with respect to a pivot location in at least a first direction and a second direction displaced 90° from said first direction,

a first at least partial sphere connected to said command control such that the center of said first partial sphere coincides with the pivot location and the surface of said first partial sphere moves about the pivot location as said command control is moved, the surface of said first partial sphere varying in property to exhibit a varying optical change in said first direction of tilt and in said second direction of tilt,

first optical response means positioned with respect to the surface of said first partial sphere for responding to said varying optical change in the surface of said first partial sphere in said first direction of tilt and producing a first electrical output, and

second optical response means positioned with respect to the surface of said first partial sphere for responding to said varying optical change in the surface of said first partial sphere in said second direction of tilt and producing a second electrical output.

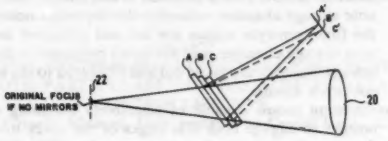
4,533,828

ARRANGEMENT FOR INCREASING THE DYNAMIC RANGE OF OPTICAL INSPECTION DEVICES TO ACCOMMODATE VARYING SURFACE REFLECTIVITY CHARACTERISTICS

Paul DiMatteo, Huntington, and Joel Hecker, Port Jefferson Station, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Dec. 3, 1982, Ser. No. 446,712
Int. Cl.³ H01J 3/14
U.S. Cl. 250—216 **8 Claims**

1. An arrangement for extending the dynamic range of sensor arrays comprising: image sensor means containing at least two sensing sites; means for imaging radiant energy from an object upon said image sensor means; and mirror means with partially reflecting surface means in the path of said radiant



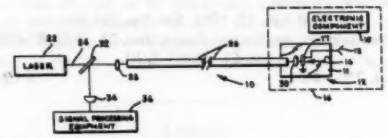
energy for generating a set of spatially displaced energy-related images of said object.

4,533,829

OPTICAL ELECTROMAGNETIC RADIATION DETECTOR

William J. Miceli, Concord, and Jacques E. Ludman, Westford, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 7, 1983, Ser. No. 511,592
Int. Cl.³ G02B 5/14
U.S. Cl. 250—227 **10 Claims**



1. An optical electromagnetic radiation detector comprising:

an electro-optic Fabry-Perot interferometer positioned at a first location, said interferometer being made up of an electro-optic material having a pair of opposed surfaces and a pair of transparent electrodes secured to said electro-optic material;

means electrically connected to said electrodes for receiving nearby electromagnetic radiation and causing a voltage to be developed across said electro-optic material, said voltage altering the effective length of said electro-optic material thereby changing the resonant condition of said electro-optic Fabry-Perot interferometer;

means positioned at a second location for providing a monochromatic beam of light;

means having one end thereof optically aligned with said monochromatic beam of light for transmitting said beam of light out the other end thereof to said Fabry-Perot interferometer, said surfaces of said Fabry-Perot interferometer reflecting said beam of light back into said other end of said transmitting means;

means adjacent said one end of said transmitting means for receiving said reflected beam of light and directing said reflected beam of light in a predetermined direction away from said light providing means; and

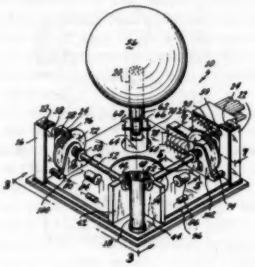
means optically aligned with said light receiving and directing means for receiving said reflected beam of light therefrom and detecting any variations in the intensity in said reflected beam of light;

whereby said variations in said intensity of said reflected beam of light is directly related to the strength of said electromagnetic radiation received by said electromagnetic radiation receiving means.

4,533,830
OPTICAL ENCODER WITH A SHUTTER CLUTCHED FOR DIRECTIONAL MOVEMENT

Richard R. Beauprey, Garden Grove, Calif., assignor to Disc Instruments, Inc., Costa Mesa, Calif.

Filed Dec. 16, 1982, Ser. No. 450,563
Int. Cl.³ G01D *5/38*
U.S. Cl. 250—231 SE 22 Claims



1. The improvement in an optical disc encoder of the type having a disc, with apertures therein, which interrupts a light source in a pulsed manner as the disc turns in order to provide for pulsed light reception by light sensors to indicate the radial movement of the disc, wherein the improvement comprises:

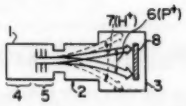
at least two light sensors on one side of the disc having an optical path in relationship to the light source that is interrupted by said disc; and,

shutter means clutched for directional movement with respect to said disc that close off one light sensor when the disc moves in one direction and closes off a second light sensor when the disc moves in the other direction in order to accommodate the output on either light sensor corresponding to the direction of rotational movement of said disc.

4,533,831
NON-MASS-ANALYZED ION IMPLANTATION

Haruo Itoh, Hino; Katsumi Tokiguchi, Machida; Terunori Warabisako; Tadashi Saitoh, both of Tokyo, and Takashi Tokuyama, Higashikurume, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1983, Ser. No. 477,375
Claims priority, application Japan, Mar. 24, 1982, 57-45617
Int. Cl.³ G01N *23/00*
U.S. Cl. 250—492.2 19 Claims



1. A non-mass-analyzed ion implantation process using ions generated from a compound without selecting a single ion species, comprising the steps of:

generating ions, which include at least two species of ions of the same polarity, from a compound source material;

accelerating said ions;

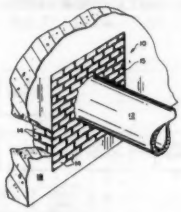
scanning said accelerated ions electromagnetically and repetitively in a direction transverse to an acceleration direction; and

implanting beams of said scanned ions, including said at least two species of ions, into a target, with said at least two species of ions being implanted with different distribution profiles of implanted ion doses.

4,533,832
RADIATION ATTENUATION MODULES AND SYSTEM AND METHOD OF MAKING THE MODULES

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014

Filed Dec. 29, 1983, Ser. No. 566,694
The portion of the term of this patent subsequent to Feb. 21, 2001, has been disclaimed.
Int. Cl.³ G21C *11/00*; G21F *3/02*
U.S. Cl. 250—519.1 30 Claims



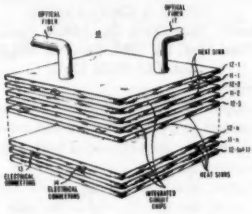
1. A radiation attenuation system, comprising:

a plurality of radiation attenuation module means, each having a substantially dimensionally stable preformed body shaped to stack against and on top of adjacent module means around a radiation emitting object, each said substantially dimensionally stable body having sufficient flexiblity to be molded against one or more irregular surfaces of said radiation emitting object, when said module means are stacked into an assembly around at least a portion of said radiation emitting object for substantially eliminating radiation exposure from said radiation emitting object.

4,533,833
OPTICALLY COUPLED INTEGRATED CIRCUIT ARRAY

John A. Copeland, Fair Haven, and Stewart E. Miller, Locust, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 19, 1982, Ser. No. 409,401
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 5 Claims



1. An integrated circuit array comprising:

a plurality of integrated circuit chips, the plurality comprising a first chip and a second chip, each chip having a pair of broad, planar surfaces;

said chips being stacked with their broad, planar surfaces substantially parallel to each other;

and means for coupling between said chips, the means comprising a multiplicity of radiation sources and radiation detectors distributed among said chips, at least a first radiation source and a first radiation detector located on the first chip, and at least a second radiation source and a second radiation detector located on the second chip, such that the first radiation source can couple radiation to at

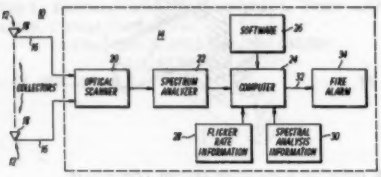
least the second radiation detector, and the second radiation source can couple energy to at least the first detector.

4,533,834

OPTICAL FIRE DETECTION SYSTEM RESPONSIVE TO SPECTRAL CONTENT AND FLICKER FREQUENCY

Ray G. McCormack, St. Joseph, Ill., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 2, 1982, Ser. No. 446,143
Int. Cl.³ H05R *33/00*
U.S. Cl. 250—554 **9 Claims**



1. A fire detection system comprising
(a) at least one ambient light collecting station;
(b) means for providing at least one known fire spectral component signature signal;
(c) means for providing at least one fire flicker rate signature signal;
(d) means for generating a spectral component signal from said collected ambient light;
(e) means for generating a flicker rate signal from said collected ambient light;
(f) means for providing a first fire detection signal by comparing said spectral component signal with at least one spectral component signature signal;
(g) means for providing a second fire detection signal by comparing said flicker rate signal with said at least one fire flicker rate signature signal; and
(h) means responsive to said first and second fire detection signals for providing an alarm signal.

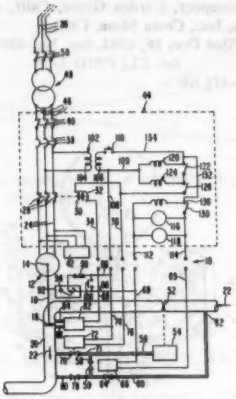
4,533,835

CONTROL APPARATUS FOR HYDRAULICALLY DRIVEN GENERATOR

Sterling Beckwith, 1824 Doris Dr., Menlo Park, Calif. 94025

Filed Mar. 15, 1984, Ser. No. 589,974
Int. Cl.³ F03B *15/02*
U.S. Cl. 290—43 **15 Claims**

1. Control apparatus for an electrical generator for supplying electrical power to a power system and driven by a turbine rotor in a fluid delivery duct provided with a shiftable throttle valve therein comprising:
a fluid actuated operator having means for coupling the operator with the throttle valve to open and close the same as a function of water pressure applied to or removed from the operator;
a first fluid line for coupling the duct to the operator to supply fluid thereto from the duct for actuating the operator to cause opening of the throttle valve;
first electrically actuated valve means for opening the first fluid line to permit fluid to flow therethrough to the operator to open the valve;
a second fluid line coupled with the operator for draining the fluid therefrom when the same has been actuated;
second electrically actuated valve means for opening the second fluid line to drain the fluid from the operator, whereby the throttle valve will then be caused to close; and
means coupled with the first valve means and the second valve means for actuating and deactuating the same as a



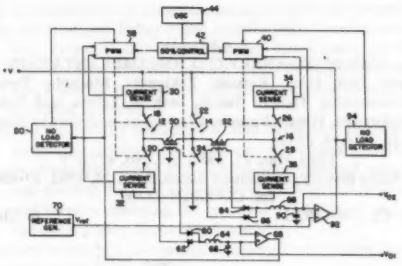
function of the voltage of the power system to which the generator is supplying power.

4,533,836

MULTIPLE VOLTAGE SWITCHING POWER SUPPLY HAVING OUTPUT VOLTAGE LIMITING

Ralph F. Carpenter, King County, and David R. Gordon, Snohomish County, both of Wash., assignors to Pacific Electro Dynamics, Inc., Redmond, Wash.

Filed Jan. 12, 1983, Ser. No. 457,408
Int. Cl.³ H02P *13/22*
U.S. Cl. 307—11 **13 Claims**



1. A multi-output-voltage switching power supply comprising:
a pair of fifty percent duty cycle switches connected in series with each other across a pair of incoming power lines, each of said switches having an internal shunting capacitance;
first control means for alternately closing said fifty percent duty cycle switches, with each of said switches being closed for substantially the same time as the other;
a plurality of pairs of first and second pulse-width modulated switches connected in series with each other across said incoming power lines, respectively, each of said switches having an internal shunting capacitance;
respective power supply circuits connected from the junction between each pair of interconnected pulse-width modulated switches to the junction between said fifty percent duty cycle switches, each of said power supply circuits generating a DC output voltage that is a function

of the closure times of its respective pulse-width modulated switches; and

respective pulse-width modulated control means operating in synchronism with said first control means for closing said second pulse-width modulated switch in each pair for a portion of the time that said first fifty percent duty cycle switch is closed, and for closing said first pulse-width modulated switch for a portion of the time that said second fifty percent duty cycle switch is closed, the closure time of said pulse-width modulated switches being adjusted to maintain the DC output voltage at a predetermined value, whereby N DC output voltages can be generated from N+1 pairs of series-connected switches;

comparator means for generating a no-load indicating signal in response to said output voltage exceeding a predetermined value; and

gating means energized by said no-load indicating signal for altering the operation of said pulse-width modulated control means so that said pulse-width modulated switches operate in synchronism with said fifty percent duty cycle switches so that the voltage at the junction between the respective pairs of pulse-width modulated switches is always equal to the voltage at the junction between the fifty percent duty cycle switches, whereby the voltage applied to the power supply circuit connected therebetween is always zero.

4,533,837

KEYBOARD-EQUIPPED APPARATUS SUCH AS AN ELECTRONIC CALCULATOR WITH BATTERY THROW MEANS FOR ENABLING A POWER SUPPLY CIRCUIT

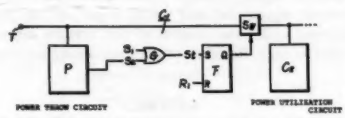
Shinichi Tanaka, Nara, and Takitsugu Mineyama, Uda, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 438,331, Nov. 1, 1982, abandoned, which is a continuation of Ser. No. 891,640, Mar. 30, 1978, abandoned. This application May 29, 1984, Ser. No. 614,702

Claims priority, application Japan, Mar. 31, 1977, 52-37078

Int. Cl.³ H01H *3/00;* **H03K** *17/22*

U.S. Cl. 307—116 **3 Claims**



1. A power supply controller for an apparatus including an input keyboard comprising:

a power supply;

switch means for selectively electrically interconnecting said power supply to said apparatus upon receipt of a control signal;

power throw means for detecting an interconnection of said power supply to said switch means and producing a power supply enable output for a time period after said interconnection;

power supply control means being operatively interconnected to said power throw means and said input keyboard for selectively controlling said switch means, said power supply control means generating said control signal upon generation of said power supply enable output and upon actuation of a key of said input keyboard for a predetermined time duration, said power supply control means including,

flip-flop means, responsive to the application of a set signal thereto, for storing said set signal and applying it to said switch means as said control signal, said control signal being applied to said switch means only until the application of a reset signal to said flip-flop means, and

OR gate means connected to said flip-flop means for receiving input signals from said input keyboard and said power supply enable output and producing a set signal for application to said flip-flop means in response to either a said input signal or said power supply enable output.

4,533,838

DIODE DRIVER CIRCUIT HAVING STORED CHARGE CONTROL MEANS

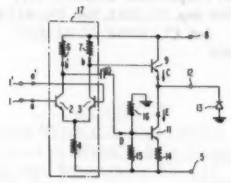
Toshio Fujita, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1982, Ser. No. 446,307

Claims priority, application Japan, Dec. 18, 1981, 56-205950

Int. Cl.³ H03K *17/00*

U.S. Cl. 307—270 **6 Claims**



1. A diode driver circuit comprising: switching means responsive to an input signal, a diode means for modulation or switching, said diode means having a forward bias state and a reverse bias state, a low impedance circuit means connected to said switching means and said diode means for feeding a reverse voltage to said diode means in response to a first output of said switching means to switch said diode means from said forward bias state to said reverse bias state, and a constant current circuit means connected to said diode means for supplying a current in the forward direction to said diode means, said constant current circuit means including means responsive to a second output of said switching means for supplying an excess current for only a period of time in which said diode means is switched from said reverse bias state to said forward bias state.

4,533,839

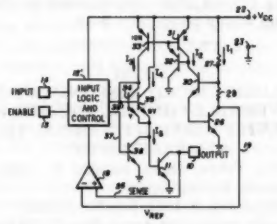
CURRENT LIMITING CIRCUIT FOR HIGH CURRENT PERIPHERAL DRIVERS

Ramanatha V. Balakrishnan, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 10, 1983, Ser. No. 456,934

Int. Cl.³ H03K *17/60, 3/26*

U.S. Cl. 307—270 **10 Claims**



1. In a peripheral driver circuit which includes at least one current sink transistor having an uncommitted collector that can sink a substantial current in response to a logic operated base current and wherein said logic further responds to the voltage present on said uncommitted collector whereby said current sink transistor is turned off when said voltage exceeds a predetermined reference potential so that when said current sink transistor is driven from a current source that exceeds its

saturation capability it is protected, the improvement comprising:

a reference transistor;

means for passing a reference current through said reference transistor; and

means, responsive to said reference current, for developing a controlled base current drive for said current sink transistor whereby its saturation current is limited to a safe design value.

4,533,840

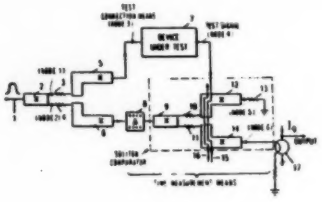
SOLITON SAMPLER

Tushar R. Gheewala, Yorktown Heights, and Steven B. Kaplan, LaGrangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,818

Int. Cl.³ H03K *17/92, 3/38*

U.S. Cl. 307—306 **3 Claims**



1. A sampling circuit, for a device-under-test, characterized by:

(a) a soliton generator 2 to provide first and second soliton generator output nodes (Node 1, Node 2);

(b) connection means (Node 3) for connecting a device-under-test 7 to the first output node (Node 1) of said soliton generator 2 to provide a test signal at a test signal node (Node 4);

(c) time measurement means including a programmable delay line 8 and soliton comparator 9–14 connected to the second output node (Node 2) of said soliton generator 2, said soliton comparator having first and second soliton comparator output nodes (Node 5, Node 6);

(d) termination means 13 connected to the first output node (Node 5) of said time measurement means 8–14;

(e) detection means connected to the second output node of said time measurement means;

(f) test control means 15 connected to said test signal node (Node 4) and connected across said soliton comparator 9–14; and

(g) sampling control means 16 connected in control mode across said soliton comparator 9–14.

4,533,841

MOS LOGIC CIRCUIT RESPONSIVE TO AN IRREVERSIBLE CONTROL VOLTAGE FOR PERMANENTLY VARYING ITS SIGNAL TRANSFER CHARACTERISTIC

Satoshi Konishi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 3, 1982, Ser. No. 414,832

Claims priority, application Japan, Sep. 3, 1981, 56-138835; Sep. 16, 1981, 56-145810

Int. Cl.³ H03K *19/094, 19/173, 19/20*

U.S. Cl. 307—468 **19 Claims**

1. A MOS logic circuit comprising:

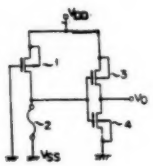
MOS logic circuit means coupled between a pair of power supply terminals (V_{DD}, V_{SS}), which circuit means performs a particular logic function and includes:

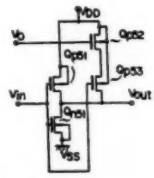
at least first and second MOS field effect transistors, at least one gate electrode of which is connected to a first signal input terminal, said first and second transistors having source-drain current paths mutually connected together to form a node;

a signal output terminal;

means for coupling said node to said signal output terminal (Vout);

signal generator means which includes a fuse for generating an irreversible control voltage (Vo); and





control circuit means which includes at least a third MOS field effect transistor, a gate electrode of which is connected to receive said irreversible control voltage (Vo) derived from said generator means and a source-drain current path of which is coupled between one of said power supply terminals (V_{DD}, V_{SS}) and said node, whereby signal transfer characteristics between input-/output signals of said MOS logic circuit means are changed under the control of said control circuit means with the logic function thereof remaining unchanged.

4,533,842

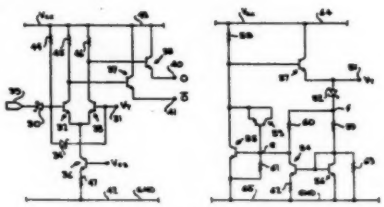
TEMPERATURE COMPENSATED TTL TO ECL TRANSLATOR

Tsen-Shau Yang, San Jose, and Michael Allen, San Francisco, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 1, 1983, Ser. No. 556,880

Int. Cl.³ H03K *19/092, 19/086, 19/003*

U.S. Cl. 307—475 **12 Claims**



1. In a level shift circuit for translating a voltage level representing a digital state in one logic family to a voltage level representing a digital state in another logic family and including an emitter-coupled differential transistor pair having their respective collectors connected through resistors to a supply

line, having their emitters coupled together and to a current source, and further including input blocking means having temperature dependence connected from an input node to the base of one transistor of the differential transistor pair, and including a means for generating a threshold voltage, V_T, that is connected to the base of the other transistor of the differential transistor pair, the improvement comprising:

said means for generating a threshold voltage, V_T, comprising a bandgap reference voltage generator and said bandgap reference voltage generator includes

means for generating a temperature independent voltage at a first node, and

a temperature dependent circuit element that tracks the temperature dependence of said input blocking means, connected between said first node and a second node, said second node supplying said threshold voltage, V_T.

4,533,843

HIGH PERFORMANCE DYNAMIC SENSE AMPLIFIER WITH VOLTAGE BOOST FOR ROW ADDRESS LINES

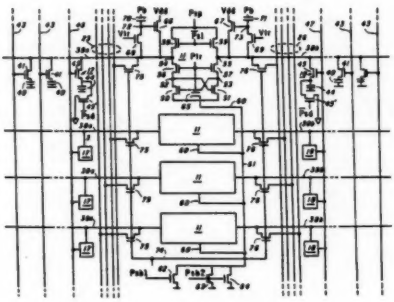
Joseph C. McAlexander, III, Sugarland; Lionel S. White, Jr., and G. R. Mohan Rao, both of Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 199,773, Oct. 20, 1980, , which is a division of Ser. No. 944,822, Sep. 22, 1978, Pat. No. 4,239,993.

This application Oct. 15, 1984, Ser. No. 660,771

Int. Cl.[3] H03K *5/24*; G11C *7/06, 8/00*

U.S. Cl. 307—530 **7 Claims**



1. A sense amplifier for a semiconductor memory device; said device having a plurality of sense amplifiers and an array of rows and columns of memory cells at a face of a semiconductor body with each column having two column line halves and each one of said sense amplifiers connected to pairs of sense nodes at ends of each pair of column line halves; comprising:

a pair of cross-coupled driver transistors for each sense amplifier, at least one grounding transistor, each of the transistors having a current path and a control electrode, and a pair of pull-up means for each sense amplifier, each of the pull-up means having a current path,

means connecting the current path of each one of the driver transistors separately between one of the sense nodes and a grounding node and connecting the current path of the grounding transistor between the grounding nodes of a plurality of sense amplifiers and reference potential,

the current paths of the pull-up means being connected separately between the sense nodes and a supply voltage level,

means for precharging the sense nodes to a selected voltage level prior to an avtive operating cycle,

means for addressing a row line for a selected row of the memory cells in the array at a given time in the beginning of said operating cycle by applying to said selected row line a voltage of about said supply voltage level,

means for applying a clock voltage to turn on said at least one grounding transistor at a first time subsequent to the said given time in the beginning of an active operating cycle,

means to activate one of said pull-up means to boost the voltage on the sense node to which said one of the pull-up means is connected to said supply voltage level, at a time in the active operating cycle following the first time,

said selected row line of the memory cells being raised to a voltage higher than said supply voltage level at a time during said active cycle after said first time.

4,533,844

PEAK STORAGE AMPLIFIER

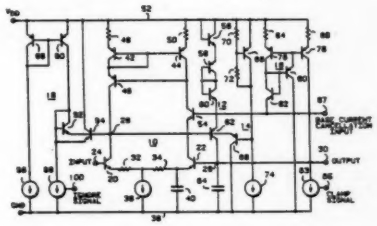
Ira Miller, and Robert B. Davies, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 352,904, Feb. 26, 1982, abandoned.

This application Jan. 24, 1985, Ser. No. 694,895

Int. Cl.[3] H03K *5/20*; H03F *3/45*

U.S. Cl. 307—530 **10 Claims**



1. A peak storage amplifier for storing a peak amplitude of an input waveform, comprising:

output means for providing an output at an output terminal, comprising:

a first PNP transistor having an emitter coupled to a first voltage conductor and a collector coupled to said output terminal;

a first switching device having a control electrode coupled to receive said input waveform, a first current carrying electrode coupled to a node, and a second current carrying electrode coupled to a base of said first PNP transistor, said node coupled to a second voltage conductor;

a second switching device having a control electrode coupled to to said collector of said first PNP transistor, and a first current carrying electrode coupled to said node;

a first mirror network coupled between said first voltage conductor and both said second current carrying electrode of said first switching device and a second current carrying electrode of said second switching device; and

preventing means coupled between said first current carrying electrode of said second switching device and said second voltage conductor for preventing said first mirror network from turning off;

storing means coupled between said collector of said first PNP transistor and said second voltage conductor for storing said output at the amplitude of said peak; and

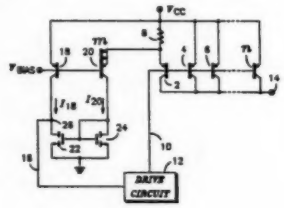
enabling means coupled to said storing means and coupled to receive an enabling signal for enabling said storage means.

4,533,845

CURRENT LIMIT TECHNIQUE FOR MULTIPLE-EMITTER VERTICAL POWER TRANSISTOR

Byron G. Bynum, and David L. Cave, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 22, 1984, Ser. No. 582,360
Int. Cl.³ H03K *5/08, 17/08*
U.S. Cl. 307—540 **7 Claims**



1. Current limiting circuitry for a power transistor which includes a base, at least one collector and a plurality of emitters, comprising:

first impedance means having a first terminal coupled to only a fraction of the number of said plurality of emitters and a second terminal coupled to a first source of supply voltage, said first impedance means having a value which is substantially different from any impedance in the remainder of said plurality of emitters;

first means for turning said power transistor on and drawing a first current through said first impedance means which is related to the total current being conducted by said power transistor in a prescribed manner; and

second means for monitoring the voltage across said first impedance means for limiting said first means when the voltage across said first impedance means reaches a certain level, said second means comprising a first transistor having base, emitter and collector terminals, said emitter being coupled to said second terminal of said first impedance means; a second transistor having base and collector terminals and the plurality of emitter terminals, each of said emitter terminals being coupled to said first terminal of said first impedance means, said first and second transistors having a base for coupling to a bias voltage which turns said first and second transistors and resulting in the generation of first and second currents respectively; and current mirror means coupled between a second source of supply voltage and said first and second transistors for generating a trigger when the voltage across said first impedance means reaches a certain level, said trigger being applied to said first means so as to limit current from said power transistor.

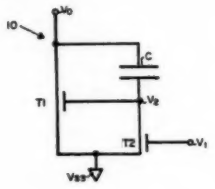
4,533,846

INTEGRATED CIRCUIT HIGH VOLTAGE CLAMPING SYSTEMS

Richard T. Simko, Los Altos, Calif., assignor to Xicor, Inc., Milpitas, Calif.

Continuation-in-part of Ser. No. 230,683, Feb. 2, 1981, , and a continuation-in-part of Ser. No. 6,026, Jan. 24, 1979, Pat. No. 4,314,265, and a continuation-in-part of Ser. No. 6,030, Jan. 24, 1979, Pat. No. 4,274,012. This application May 27, 1982, Ser. No. 382,713
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—550 **17 Claims**

1. An integrated circuit for clamping a high voltage source having a limited current output, so that said source does not exceed a predetermined potential, comprising: high potential input means for making electrical connection with a high voltage power source desired to be clamped; grounding means for making electrical connection with a reference potential current sink; a control potential node; means responsive to the potential of said high potential input means exceeding a predetermined potential for developing a clamping control potential at said control potential node as a function of the difference between the potential of said high potential input means and said predetermined potential; and clamping current control



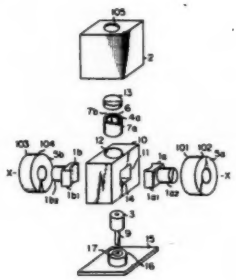
means responsive to said clamping control potential at said control potential node for regulating the flow of current between the high potential input means and the grounding means such that said current is conducted only when the potential of said high potential input means exceeds a predetermined value.

4,533,847

ROTARY DRIVE APPARATUS WITH PERMANENT MAGNETS ON THE ROTOR AND STATOR

Takaharu Idogaki; Ikuo Hayashi, both of Okazaki; Hisasi Kawai, Toyohashi; Kyo Hattori, Susono, and Kazuhiro Sakurai, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 1, 1984, Ser. No. 616,187
Claims priority, application Japan, Jun. 2, 1983, 58-97008
Int. Cl.³ H02K *1/00*
U.S. Cl. 310—181 **20 Claims**



1. A rotary drive apparatus comprising:

a frame having at least three holes;

yoke means having a center portion and two side bar portions on opposite sides of the center portion, the center portion having a hole;

coil means mounted on the side bar portions of the yoke means;

collar means having a bore and being tightly mounted on the surface of the hole of the yoke means;

magnetic parameter changing means being mounted on the surface of the bore of the collar means; and

rotor means having magnetic poles in the radial direction and being inserted into the bore of the collar means with a predetermined clearance;

wherein a first hole of the frame is parallel to a first direction of the apparatus and has a cross-section for tightly receiving the center portion of the yoke means;

second and third holes of the frame are in a second direction

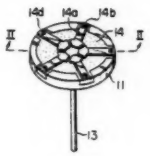
perpendicularly intersecting the first direction and being concentric with each other oppositely the first hole;
the center portion of the yoke means being fit into the first hole;
the position of the collar means is adjusted through the second hole, during the adjustment, and
the third hole passes a shaft connected to one end of the rotor means.

4,533,848

ROTOR OF CORELESS MOTOR

Yoshimitsu Nakamura, Settsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 908,373, May 22, 1978,. This application Dec. 27, 1979, Ser. No. 107,644
Claims priority, application Japan, May 27, 1977, 52-69093
Int. Cl.³ H02K *13/04*
U.S. Cl. 310—237 **2 Claims**



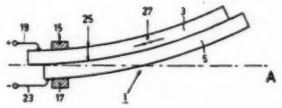
1. A rotor of a coreless motor comprising an electrically insulative substrate of disk shape, a metal foil layer of disk shape having a planar surface portion on each side, one of said planar surface portions being mounted on a planar surface portion of said substrate, rotary metallic shaft means including an elongate shaft, said shaft means including a planar surface portion at one end mounted to the other planar surface portion of said foil layer at the center of said foil layer such that said shaft extends in perpendicular relation to the substrate, the area of said planar surface of said foil mounted to said substrate being larger than the cross-sectional area of said shaft, a cylindrically wound coil secured at an axial end to the periphery of the substrate in coaxial relation to said rotary shaft, and a plurality of commutator segments each formed of a metal foil and being disposed on a surface of said substrate opposite said planar surface portion of said substrate and being electrically connected to exposed conductors at said axial end of said cylindrical coil.

4,533,849

CERAMIC BISTABLE DEFLECTION ELEMENT

Axel Schnell, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 24, 1983, Ser. No. 544,754
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1982, 3240884
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—330 **4 Claims**



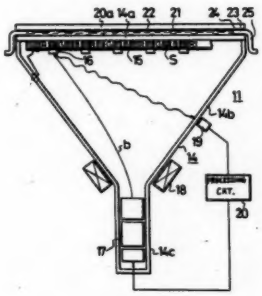
1. A bistable deflection assembly, comprising:
two plates each having an inner principal surface provided with an inner electrode and each also having an outer principal surface provided with an extreme electrode, the plates being arranged such that the inner electrodes are adjacent and electrically contact one another and such that the inner electrodes are electrically accessible, the plates being rigidly interconnected and being formed of a ferroelectric, easily polarizable ceramic material having a low coercive field strength, one plate being polarized by applying a direct voltage at the inner and extreme electrodes of only the one plate after the one plate is rigidly interconnected to the other plate, the other plate being non-polarized, so that the assembly is deflected to a first stable position, and
two electrical connections provided, respectively, on the two extreme electrodes so that the plates are in a series electrical arrangement, whereby the assembly can be deflected to a second stable position by another direct voltage applied to the electrical connections, the another direct voltage having a polarity opposite that of the direct voltage used for polarizing the one plate, the application of the another direct voltage depolarizing the one plate while polarizing the other plate.

4,533,850

COLOR PROJECTOR APPARATUS OF SINGLE CATHODE RAY TUBE TYPE

Akio Ohkoshi, Tokyo; Takashi Toyama, Kokubunji, and Toshiro Watanabe, Zushi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 10, 1983, Ser. No. 474,133
Claims priority, application Japan, Mar. 19, 1982, 57-45200
Int. Cl.³ H01J *7/26, 29/10*
U.S. Cl. 313—36 **3 Claims**



1. A high brightness cathode ray tube comprising:
(a) a single, color cathode ray tube of index-type having a first transparent panel with phosphor elements of three primary colors and an indexing element formed on the inner surface thereof;
(b) a second transparent panel located in front of said first transparent panel of said cathode ray tube;
(c) a metal frame-shape spacer for supporting said second transparent panel; and
(d) a transparent liquid coolant filled into the space between said first and second transparent panels.

4,533,851

HIGH-PRESSURE ELECTRIC DISCHARGE LAMP WITH INTERFITTING SOCKET AND SUPPORT

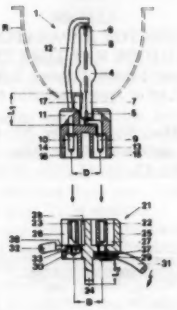
Werner Block, Taufkirchen, and Wolfgang Greiler, Unterhaching, both of Fed. Rep. of Germany, assignors to Patent-Treuhand Gesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 15, 1983, Ser. No. 532,584
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1982, 3236462
Int. Cl.³ H01J *5/48, 5/50*
U.S. Cl. 313—51 **14 Claims**

1. High-pressure electric discharge lamp (1) comprising an

elongated discharge vessel (4) having a longitudinal axis and a base (11) for holding and electrically connecting said discharge vessel and a socket (21) in combination therewith into which said base fits for mechanical support and electrical connections, said lamp further comprising two electrodes (2,3) respectively disposed towards opposite ends of said discharge vessel (4) on said axis, electrical connection leads (5,6) being provided for supplying an electrical connection through the wall of said vessel (4) for said respective electrodes, fused seals (7,8) surrounding said connection leads being provided in said vessel wall, said combination further having the improvement which comprises:

two contact elements (9,10) embedded in said base, one (9) of which is disposed for making contact with one (5) of said connection leads at one end of said vessel fitting into said base, and the other (10) of which is provided with an electrically conducting extension (12) for making contact to the other (6) of said connection leads which is the more remote from said base, said base being made of material



capable of providing insulation at high voltage and having collars (15,16) of said material at least partially surrounding said contact elements at their extremities away from said vessel at a spacing from said respective contact element extremities, and

third and fourth contact elements (22,23) set in said socket (21) for mechanically gripping engagement with said two contact elements (9,10) of said base and having means for supply voltage connection at their ends away from said base, said support being made of material capable of providing insulation at high voltage and having a partition web of said material separating said third and fourth contact elements at a spacing therefrom and projecting beyond the ends thereof having supply voltage connection means, as well as contributing to defining cavities (27,28) further formed by collar walls (25,26) of said material extending at least partially around the supply voltage connection ends of said third and fourth contact elements (22,23) at a spacing therefrom.

4,533,852

METHOD OF MANUFACTURING A THERMIONIC CATHODE AND THERMIONIC CATHODE MANUFACTURED BY MEANS OF SAID METHOD

Berthold Frank; Georg Gärtner, both of Aachen, and Hans Lydtin, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1982, Ser. No. 447,079

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148441

Int. Cl.³ H01J *1/28, 1/13*

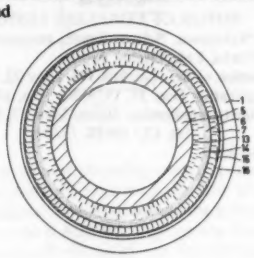
U.S. Cl. 313—346 DC **30 Claims**

1. A method of manufacturing a thermionic cathode having a polycrystalline coating layer of a high-melting metal which is deposited on underlying layers, characterized in that

(a) the following layer structure is provided on a substrate, formed in accordance with a desired cathode geometry, by gaseous phase transport, preferably accompanied by reducing reactions during or after deposition of the layers;

(α) A supporting layer of high-melting metal as a base material including at least one dopant for the mechanical structural stabilization thereof

(β) a layer or a series of layers which during operation of the cathode act as a dispensing and supply region for formation of an emitter monolayer, consisting of a high-melting metal as a base material and a store of electron-emissive material, and



(γ) a polycrystalline coating layer particularly a preferred oriented polycrystalline coating layer of a high melting metal as a base material and at least one dopant for the stabilization of the crystal texture and structure thereof, the preferred orientation being adjusted by the choice of the deposition parameters in such manner, that the work function from the emitter monolayer which during operation of the cathode is maintained on said coating layer, is minimum,

(b) the substrate is removed, and

(c) the supporting layer is provided with connections for its heating.

4,533,853

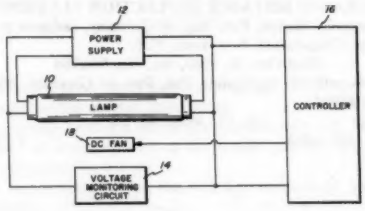
MECHANISM AND METHOD FOR CONTROLLING THE TEMPERATURE AND OUTPUT OF A FLUORESCENT LAMP

Thomas J. Hammond, Penfield; William L. Lama, Webster; Karl A. Northrup, and Stephen C. Corona, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1983, Ser. No. 478,745

Int. Cl.³ H01J *7/24, 13/32, 19/74, 61/52*

U.S. Cl. 315—117 **4 Claims**



1. A monitoring and control mechanism for optimizing the light output of a fluorescent lamp containing an excess of mercury at a cold spot therein, said mechanism comprising:

a power supply for applying operating power to said lamp, said power supply adapted to maintain a constant operating current through said lamp resulting in a lamp arc voltage which is a function of the lamp mercury pressure,

a monitoring means for detecting a decrease from a maximum lamp are voltage associated with an optimum cold

spot temperature, and generating a signal indicative thereof,

a temperature control device placed in proximity to said cold spot, said device, when operational, serving to provide a constant intensity output to low the temperature of the cold spot and, when non-operational, effectively permitting the cold spot temperature to rise, and

a controller circuit adapted to change the operational state of said temperature control device in response to the output signals from said monitoring means.

4,533,854

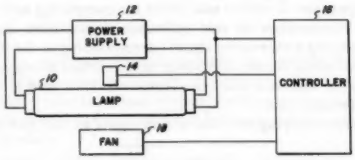
MECHANISM AND METHOD FOR CONTROLLING THE TEMPERATURE AND OUTPUT OF A FLUORESCENT LAMP

Karl A. Northrup, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1983, Ser. No. 478,746

Int. Cl.³ H01J *7/24, 13/32, 19/74, 61/52*

U.S. Cl. 315—117 **4 Claims**



1. A monitoring and control mechanism for optimizing and controlling the light output of a fluorescent lamp containing an excess of mercury at a cold spot therein, said mechanism comprising:

a power supply for applying a constant operating current to said lamp,

a monitoring means for detecting a drop in a light output of said lamp and for generating a signal indicative thereof,

a temperature control device placed in proximity to said cold spot, said device, when operational, serving to provide a constant intensity output to lower the temperature of the cold spot and, when non-operational, effectively permitting the cold spot temperature to rise,

a controller circuit adapted to change the operational state of said temperature control device in response to the output signals from said monitoring means.

4,533,855

SWITCHED CAPACITOR S-CORRECTION CIRCUIT

Donald H. Willis, and David W. Luz, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 16, 1983, Ser. No. 562,246

Int. Cl.³ H01J *29/70, 29/76*

U.S. Cl. 315—370 **9 Claims**

1. A line deflection circuit comprising:

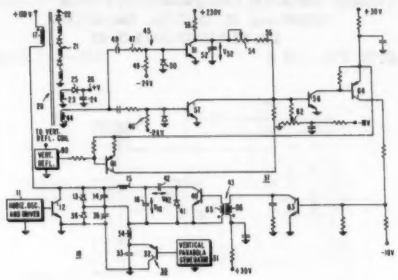
a line deflection winding:

means for providing a deflection current in said line deflection winding defining deflection intervals having trace and retrace intervals;

a first capacitor coupled to said deflection winding for providing linearity distortion correction to said deflection current;

a second capacitor; and

means for selectively coupling said second capacitor to said deflection winding during portions of each of said deflection intervals for supplying additional amounts of linearity



distortion correction to said deflection current during each of said portions of said deflection intervals.

4,533,856

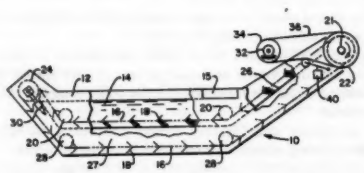
SUBMERGED SCRAPER CONVEYOR AUTOMATIC SPEED CONTROL

Dennis M. Malone, West Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 18, 1983, Ser. No. 485,919

Int. Cl.³ F23H *11/24*

U.S. Cl. 318—6 **10 Claims**



1. In a submerged scraper conveyor having a drag chain for removing material from a water impounded hopper, the drag chain having a plurality of flights mounted thereon, apparatus for controlling the speed of the submerged scraper conveyor, comprising:

a. a variable speed drive means;

b. a first sprocket operatively connected to the variable speed drive means;

c. a headshaft for driving the drag chain;

d. a second sprocket operatively connected to the headshaft;

e. an endless chain passing around the first and second sprockets;

f. a transducer for measuring the tension in the endless chain and for generating a signal proportional to the tension;

g. control means for receiving the signal generated by the transducer and for generating a desired drag chain speed signal therefrom; and

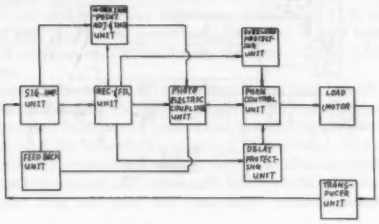
h. means for applying the desired drag chain speed signal generated by the control means to the variable speed drive means to vary the speed of the variable speed drive means as a function of the tension in the endless chain.

4,533,857

ELECTRICAL ENERGY SAVING DEVICE FOR MOTORS

Ten-Ho Chang, and Shin-Yih Wang, both of 18, Alley 9, Lane 75, Chia-Shu North Rd., Chang-Hua City, Taiwan

Filed Aug. 31, 1982, Ser. No. 413,394
Int. Cl.³ H02P 5/16, 5/40
U.S. Cl. 318—345 A 22 Claims



1. An electrical energy saving device for motors, which comprises:

(a) principal means comprising,

(i) transducer means connected between the input power source and the motor for providing a signal indicative of the electric power being utilized by the motor; and

(ii) triggering device means connected between the input power source and the motor for providing the electric power to the motor in response to receipt of a triggering signal;

(b) control means, connected to the input power source, said transducer means and said triggering device means, for providing said triggering signal to said triggering device means so that the optimal amount of the electric power is provided to the motor, where said triggering signal is generated in accordance with the signal of said transducer means which is reduced when the motor is operating in the normal range by a negative feedback signal indicative of the electric power supplied by the power source, wherein said control means further comprises:

(c) a power supply means;

(d) a signal amplifying means associated with said transducer means of said principal means;

(e) feedback means electrically connected to said signal amplifying means and said power supply means for providing negative feedback signals to said signal amplifying means;

(f) rectifying and filtering means coupled with said signal amplifying means and said feedback unit means;

(g) photoelectric coupling means electrically connected to said rectifying and filtering means with respect to said signal amplifying means;

(h) working-point adjusting and indicating means electrically connected to said photoelectric coupling means and said rectifying and filtering means;

(i) overload protecting means coupled with said working-point adjusting and indicating means and said photoelectric coupling means; and

(j) delay protecting means coupled with said overload protecting means and said photoelectric coupling means.

4,533,858

TEMPERATURE COMPENSATION APPARATUS FOR GEAR SHAPERS

Erich Flaker, Springfield, Vt., assignor to Fellows Corporation, N. Springfield, Vt.

Filed Sep. 16, 1983, Ser. No. 533,846
Int. Cl.³ G05D 23/275
U.S. Cl. 318—634 5 Claims

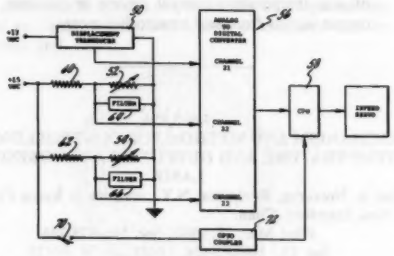
1. An apparatus for compensating for thermal expansion or contraction of a machine component along an axis, said component movable along said axis relative to another component by a motor, comprising:

means for establishing a reference temperature;

means for determining an average temperature of said machine component;

comparator means for determining if said average temperature is within predetermined limits;

means responsive to said comparator means for stopping the operation of said machine if said average temperature is not within said limits;



means responsive to said comparator means if said average temperature is within said limits for comparing said average temperature to said reference temperature and for producing a correction signal corresponding to the dimensional effect on the difference between said average temperature and said reference temperature; on said machine component; and

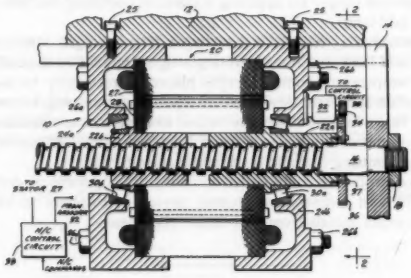
means for applying said correction signal to said motor.

4,533,859

MOTORIZED BALL NUT

Richard Johnstone, Brookfield, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Mar. 15, 1982, Ser. No. 358,346
Int. Cl.³ G05B 1/06
U.S. Cl. 318—661 3 Claims



1. In a machine tool having a movable member mounted on a support for movement in a predetermined path of travel relative to said support; a control circuit connected to regulate the operation of the machine tool; and a drive mechanism connected to drive said movable member in its path of travel and comprising: a screw rigidly mounted on said support and fixed against rotation; a nut in threaded engagement with said screw; a motor frame rigidly secured to said movable member; an annular stator mounted to said frame; means electrically connecting said stator to the numerical control circuit to be energized thereby; a rotor disposed within the central opening of said stator to be rotated thereby and having an axial bore for receiving said nut; means securing said nut to said rotor for rotation in unison therewith; a transducer supported by said frame and connected to rotate with said nut, and means connecting said transducer to the numerical control circuit to provide feedback information for use by the numerical control circuit in controlling the rotation of the rotor.

4,533,860

APPARATUS FOR ADJUSTING THE INCLINATION OF AUTOMOBILE HEADLAMP

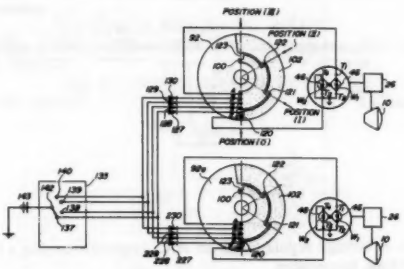
Kunihiro Saito, Shiraokamachi, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,100

Claims priority, application Japan, Oct. 14, 1983, 58-190903; Apr. 24, 1984, 59-81141

Int. Cl.³ B60Q 1/06

U.S. Cl. 318—673 9 Claims



1. An apparatus for adjusting the inclination of automobile headlamp having a linearly movable member mechanically coupled to the headlamp assembly and a reduction gear group mechanically coupled to the member and driven by a motor comprising:

a power source having a negative terminal and a positive terminal,

a DC electric motor having a first winding and a second winding wound on a stator or a rotor, the ends of the first and second windings being respectively connected to input terminals and output terminals formed on motor body, the output terminals being connected to the negative terminal of the power source and constructed to rotate the rotor in opposite directions when either input terminal of the first and second windings is electrically connected to the positive terminal of the power source,

angular position switch member having a pair of conductor units respectively connected to the input terminals and spaced from each other and a plurality of contacts relatively movable and relative at 1:1 to a plurality of predetermined angular positions of the light bulb, said relative movement being carried out in response to the variation in the angular position of the light bulb, insulating portions formed corresponding to the angular positions of the light bulb on a trace formed by the plurality of contacts during the relative movement between a pair of conductor units, the other contact making contact with either one of the conductor units when one of the contacts makes contact with the corresponding insulating portion,

operation switch members each having stationary contact group having a plurality of switch positions connected to the plurality of contacts of said angular position switch member and movable contacts contacted selectively with one of the stationary contacts and connected to the positive terminal of the power source;

said operation switch member being switched from one switch position to other switch position, thereby electrically connecting the stationary contact corresponding to the other switch position to either of the conductor units of the angular position switch member, with the result that either of the first and second winding of the motor is energized to rotate the motor in the corresponding direction, thereby stopping the motor when the contact corresponding to the other switch position of the plurality of contacts of the angular position switch member makes contact with the corresponding insulating portion.

4,533,861

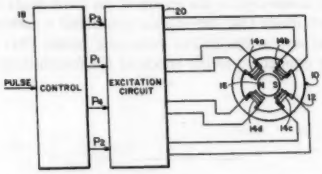
STEPPING MOTOR DRIVE CIRCUIT

Jerrold J. Rogers, and Joseph S. Trumps, both of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 13, 1983, Ser. No. 541,762

Int. Cl.³ H02K 29/04

U.S. Cl. 318—696 4 Claims



1. A stepping motor drive circuit for a stepping motor having an even number of uniformly space drive coils to cause rotation of the rotor of the motor, the energization of said coils being controlled by a plurality of uniformly interleaved pulses wherein the number of drive coils is an integer number multiple of the number of pulses and each Pulse corresponds to a particular grouping of coils, the coils that are 180° apart from each other are paired for energization, the circuit disposed to be coupled to a first, a second and a third voltage potential source, said first voltage potential being greater than said second voltage Potential, and said third voltage potential being between and equidistant said first and second voltage potentials, said circuit for energizing each pair of coils comprising:

first terminal (anodes of **22** and **30**) for coupling to the source of said first voltage potential (+V);

second terminal means (cathodes of **28** and **36**) for coupling to the source of said second voltage potential (−V);

third terminal means for coupling with the coil pair, with a first node disposed for coupling one end of each coil to the third voltage potential, and a second (A) and a third (B) node each for connecting with one of the other ends of each coil of the coil pair;

fourth terminal means for coupling to the source of said third voltage potential (gnd);

a first and a second diode (**22**, **30**), each having an anode and a cathode, with the anode of each connected to the first terminal means:

a third and a fourth diode (**28**, **36**), each having an anode and a cathode, with the cathode of each connected to the second terminal means;

first switching means (**24**) for controlling the current flow from the cathode of the first diode (**22**) to the second node (A) in response to the one of said uniformly interleaved control pulses corresponding to the coil to be coupled to the second node wherein the two control pulses are 180° out of phase with each other;

second switching means (**32**) for controlling the current flow from the cathode of said second diode (**30**) to the third node (B) under the control of the other of said uniformly interleaved control pulse corrresonding to the coil to be coupled to the third node (B);

third switchng means (**26**) for controlling the current flow from the second node (A) to the anode of the third diode (**28**) under the control of the other of said uniformly interleaved control pulses;

fourth switching means (**34**) for controlling the current flow from the third node (B) to the anode of the fourth diode (**36**) under the control of said one of the uniformly interleaved control pulses;

a first and a second capacitor (**46**, **50**) each connected between the fourth terminal means and the cathode of said first and second diodes (**22**, **30**), respectively;

a third and a fourth capacitor (**48**, **52**) each connected between the fourth terminal means and the anode of said third and fourth diodes (**28**, **36**), respectively;

a fifth diode (38), having an anode and a cathode, connected across the first switching means (24) with its cathode connected to the cathode of the first diode (22);

a sixth diode (42), having an anode and a cathode, connected across the second switching means (32) with its cathode connected to the cathode of the second diode (30);

a seventh diode (40), having an anode and a cathode, connected across the third switching means (26) having its anode connected to the anode of the third diode (28); and

an eighth diode (44), having an anode and a cathode, connected across the fourth switching means (34) with its anode connected to the anode of the fourth diode (36).

4,533,862

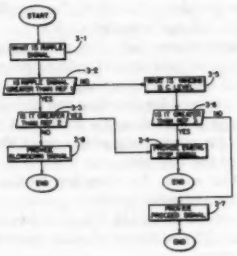
POLYPHASE MOTOR DRIVE IMBALANCE DETECTION

Jalal T. Salihi, Manchester, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 434,012, Oct. 12, 1982, abandoned. This application Dec. 4, 1984, Ser. No. 678,361

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—798 **2 Claims**



1. Apparatus comprising:

a polyphase motor for propelling an object;

a motor control and power supply for controlling and powering the motor;

characterized in that the motor control comprises:

means for operating the motor at a first speed;

hall detector means comprising individual hall detectors associated with each motor winding for providing an output signal associated with each motor winding that manifests current magnitude and direction in the winding;

means for summing output signals from the hall detectors and providing a first signal which manifests the magnitude of the ripple associated with the difference between the current flow in and out of the motor;

means responsive to the first signal and a reference level signal for providing a second signal indicating that a ripple magnitude exceeding a predetermined magnitude associated with the reference signal;

means responsive to said second signal for providing a third signal if the second signal is still provided following a predetermined time delay interval independent of the frequency of the motor current;

means responsive to said third signal for causing the motor to operate at a speed less than said first speed until the object is at a preestablished location and then stopping the motor.

4,533,863

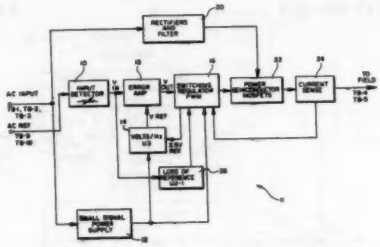
VOLTAGE REGULATOR

Dennis A. Luhn, Richfield, and Mark H. Schultz, Mounds View, both of Minn., assignors to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Oct. 26, 1983, Ser. No. 545,754

Int. Cl.³ H02P *9/30*

U.S. Cl. 322—28 **28 Claims**



1. A voltage regulator for an A.C. generator having a field winding, comprising:

(a) input terminals for connection to a generator load;

(b) output terminals for connection to the generator field winding;

(c) voltage controlled field-winding excitation control means, connected across said input terminals, for supplying direct current to said output terminals;

(d) drive means for driving said voltage controlled field-winding excitation control means;

(e) frequency sensing means for generating a voltage proportional to the frequency across said input terminals when said frequency is below a preselected break-point frequency and and for generating a constant voltage when said frequency is above said break-point frequency; and

(f) asynchronous switching regulator means, connected to said frequency sensing means and said input terminals, for producing a train of output voltage control signals adapted to operate said drive means in response to the frequency and voltage out of said generator, said break-point frequency being sufficiently high that said regulator is essentially insensitive to relatively small changes in engine speed when said generator is operating under load.

4,533,864

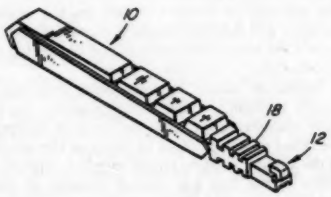
TEST INSTRUMENT WITH FLEXIBLY CONNECTED HEAD

Hollis B. Austin, Manchester, N.H., assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 21, 1983, Ser. No. 487,058

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—51 **11 Claims**



1. A test instument comprising an elongated barrel portion containing test and indicating circuitry, a rigid connector portion mateable with a corresponding connector portion terminating a circuit to be tested, and a relatively short, flexible

neck portion joining the rigid connector portion to the barrel portion, the neck portion having leads mounting thereto interconnecting the rigid connector portion and the test and indicating circuitry within the barrel portion.

4,533,865

CIRCUIT ARRANGEMENT FOR IDENTIFYING AND STORING POWER LINE FAULTS

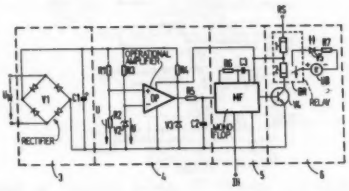
Manfred Schlenk, Augsburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,117

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209562

Int. Cl.³ G08B *21/00*; G01R *31/02*

U.S. Cl. 324—51 **2 Claims**



1. A circuit arrangement for detecting and storing power line faults, comprising:

a rectifier for connection to a power line and rectifying the power line voltage;

a comparison circuit connected to a reference voltage and to said rectifier for comparing the rectified voltage to the reference voltage and producing a predetermined voltage when the rectified voltage falls below the reference voltage;

a memory connected to said comparison circuit and responsive to the predetermined voltage to assume a predetermined storage state and including an inhibit input for receiving an inhibit signal during a start-up mode for disconnecting the arrangement between start-up so that an error display occurs; and

display means connected to said memory and operable in response to said predetermined storage state.

4,533,866

CIRCUIT FOR AUTOMATICALLY SETTING A PREDETERMINED FREQUENCY COMPONENT OF THE SWEEP OSCILLATOR OF A SPECTRUM ANALYZER TO A PRESCRIBED POINT OF THE FREQUENCY COORDINATES OF A DISPLAY DEVICE

Kurt Zirwick, Greifenberg, Fed. Rep. of Germany, assignor to Rohde & Schwarz GmbH & Co. KG, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,485

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220462

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 B **6 Claims**

1. A circuit for setting a predetermined frequency component of a voltage-controlled oscillator to a prescribed coordinate of a display of a spectrum analyzer comprising;

a frequency generator including an output and an input;

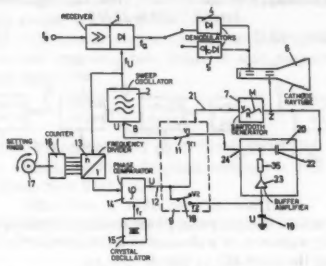
a phase control loop connected between said output and said input and including a phase comparator operable to compare the phase of the generated frequency with that of a reference and produce a tuning voltage;

a voltage-controlled oscillator connectible into said phase control loop and including an output connected to said input of said frequency generator, and a control input for receiving a control voltage;

a storage element for storing tuning voltage;

a network connected to said storage element for receiving said tuning voltage, said network including a control input for receiving a control signal and responsive thereto to emit a sweep voltage; and

switching means connected to said network, to said phase comparator, to said storage element and to said control



input of said oscillator, said switching means operable to a first condition to connect said phase comparator to said control input of said oscillator and to said storage element to cause said oscillator to operate at a frequency defined by said tuning voltage and operable to a second condition to connect said control input of said oscillator to said network to supply said sweep voltage of said network to said oscillator.

4,533,867

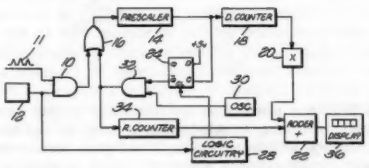
METHOD AND APPARATUS FOR MEASURING HIGH FREQUENCY SIGNALS

Edward J. Witczak, Santa Clara, Calif., assignor to EIP Microwave, Incorporated, San Jose, Calif.

Filed Aug. 23, 1982, Ser. No. 410,798

Int. Cl.³ G01R *23/02*

U.S. Cl. 324—78 R **17 Claims**



1. A method for measuring the frequency of a signal comprising the steps of:

(a) applying said signal to a prescaler to produce an output signal;

(b) counting the frequency of said output signal;

(c) storing the frequency of said output signal; then

(d) applying a sufficient number of clocking pulses to said prescaler to complete the counting cycle of said prescaler;

(e) counting the number of said clocking pulses;

(f) storing said count; then

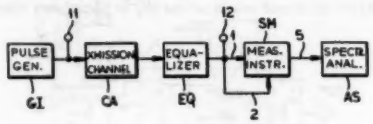
(g) combining the frequency of said output signal with said count to derive an accurate measure of the frequency of said signal.

4,533,868

ELECTRONIC INSTRUMENT FOR MEASURING THE OVERALL PHASE AND AMPLITUDE DISTORTION OF A TRANSMISSION CHANNEL

Bruno Fabbri, Turin, and Alfredo Fausone, Ivrea, both of Italy, assignors to SIP - Societa Italiana per L'Esercizio Telefonico p.A., Turin, Italy

Filed Sep. 24, 1982, Ser. No. 423,147
Claims priority, application Italy, Nov. 18, 1981, 68493 A/81
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—83 R **11 Claims**



11. A method of measuring phase and amplitude distortions incurred by signals over a channel of a communication system, comprising the steps of:

(a) transmitting a series of recurrent test pulses from one end of said channel to the other end thereof;

(b) receiving distorted pulses from said other end;

(c) extracting the recurrence frequency of said test pulses from said distorted pulses;

(d) regenerating replicas of said test pulses from the recurrence frequency extracted at said other end;

(e) comparing each of said replicas with the corresponding distorted pulse to determine phase and amplitude differences between them; and

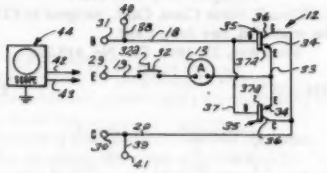
(f) displaying the detected differences over a range of frequencies.

4,533,869

FIELD TEST INSTRUMENT FOR HORIZONTAL OUTPUT CIRCUITS

Martha C. Pecorino, 2398 Coral Way, Largo, Fla. 33341

Filed Jun. 13, 1983, Ser. No. 503,593
Int. Cl.³ G01R *31/28*; H04N *7/02*
U.S. Cl. 324—158 R **1 Claim**



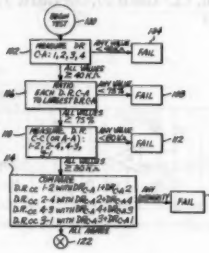
1. A field test instrument for horizontal output circuits, comprising, a housing, a cable having its proximal end secured to said housing, an adapter having a base plate secured to the distal end of said cable, a transistor circuit secured in said housing, an ammeter secured in said circuit, a circuit breaker secured in said circuit, said ammeter being electrically connected in series to said circuit breaker, said ammeter being electrically connected to the emitters of a pair of transistors in said circuit, the bases of said pair of transistors being electrically connected to each other, the base of one of said pair of transistors being electrically connected to a first terminal secured to the base plate of said adapter, the collectors of said pair of transistors being electrically connected to a second terminal secured to a first prong of said adapter, and a second prong of said adapter being electrically connected to a third terminal, which third terminal is electrically connected to said circuit breaker, whereby said adapter, when plugged into a horizontal output circuit socket of a television set, closes said output circuit with said ammeter and said pair of transistors, to give a reading of current upon the face of said ammeter, which reading will indicate if a replacement transistor should be inserted into said output circuit socket.

4,533,870

METHOD FOR TESTING MULTI-SECTION PHOTO-SENSITIVE DETECTORS

David E. Baukol, Pacific, and John W. Dorsey-Palmateer, Tacoma, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 29, 1982, Ser. No. 444,904
Int. Cl.³ G01R *31/26*
U.S. Cl. 324—158 D **2 Claims**



1. A method for testing multi-section photo-sensitive detectors comprising the steps of:

(a) measuring the cathode-anode dark resistance of each section and rejecting the detector in response to any section measuring less than a predetermined value;

(b) evaluating the ratio of the cathode-anode dark resistance of each section to the cathode-anode dark resistance of that section having the highest cathode-anode dark resistance, and rejecting the detector in response to any such ratio being less than a predetermined value;

(c) measuring the cathode-cathode or anode-anode dark resistance of each adjacent pair of sections and rejecting the detector in response to any such resistance being less than a predetermined value;

(d) comparing the cathode-cathode or anode-anode dark resistance of each adjacent section pair with the sum of the cathode-anode dark resistances for each section in said pair and rejecting the detector in response to a predetermined disparity therebetween; and

(e) evaluating the ratio of the cathode-cathode or anode-anode dark resistance of each adjacent section pair with the cathode-cathode or anode-anode dark resistance of that section pair having the highest cathode-cathode or anode-anode dark resistance and rejecting the detector in response to any such ratio being less than a predetermined value.

4,533,871

RANGE-ENABLE INFORMATION SYSTEM FOR PLURAL MOBILE OBJECTS

Peter C. Boetzkes, North Vancouver, Canada, assignor to DSL Dynamic Sciences Limited, St. Laurent, Canada

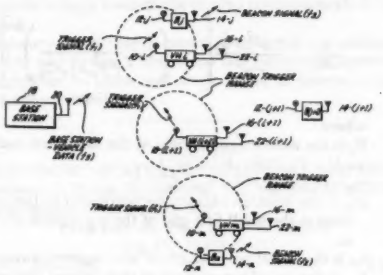
Filed Aug. 10, 1981, Ser. No. 291,409
Int. Cl.³ G01B *7/14*; G01S *13/76*
U.S. Cl. 324—207 **25 Claims**

1. An information system for communicating information from a location to a mobile object, said system comprising:

a beacon triggering and detecting apparatus mounted on the object, said beacon triggering and detecting apparatus including: means for transmitting a substantially-omnidirectional trigger signal at a first RF frequency, said trigger signal as transmitted having a substantially constant ampli-

tude and said first RF frequency being chosen so that the amplitude of said trigger signal decays, from said substantially constant amplitude, substantially as the cube of radial distance from the object at all points within a predetermined beacon trigger range surrounding the object;

a beacon mounted at the location, said beacon including: a continuously-enabled means that is operative to receive said trigger signal and to detect said trigger signal only when the object is at a distance from the location within said beacon trigger range and the amplitude of said trigger



signal as received equals or exceeds a predetermined threshold value; and, means that is enabled in response to detection of said trigger signal to transmit a beacon signal at a second RF frequency substantially greater than said first RF frequency, said beacon signal containing information desired to be communicated from the location to the object;

and wherein said beacon triggering and detecting apparatus further includes: means receiving and detecting said beacon signal and extracting the information contained therein.

4,533,872

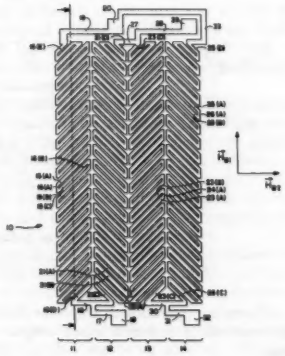
MAGNETIC FIELD SENSOR ELEMENT CAPABLE OF MEASURING MAGNETIC FIELD COMPONENTS IN TWO DIRECTIONS

Warren T. Boord, Brooklyn Park, and Richard B. Fryer, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 14, 1982, Ser. No. 388,066

Int. Cl.³ G01R *33/06;* **G01C** *17/00;* **H01L** *43/08*

U.S. Cl. 324—252 **25 Claims**



1. A sensor useful in determining orientation with respect to an external magnetic field comprising:

magnetic field sensing means having an output terminating region, said magnetic field sensing means being arranged to provide an output signal at said magnetic field sensing means output terminating region, said output signal being representative of external magnetic field components in a first direction when a first bias magnetic field is applied to said magnetic field sensing means in a second direction, and said output signal being representative of external magnetic field components in a third direction when a second magnetic bias field is applied to said magnetic field sensing means in a fourth direction;

magnetic field biasing means adapted to provide said first and second magnetic bias fields to said magnetic field sensing means.

4,533,873

R.F. PHASE SHIFT CONTROL SYSTEM

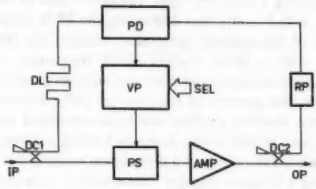
Robert N. Alcock, Dorking, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 2, 1982, Ser. No. 446,139

Claims priority, application United Kingdom, Dec. 4, 1981, 8136614

Int. Cl.³ H03H *11/20*

U.S. Cl. 328—155 **6 Claims**



1. A controlled-phase R.F. system comprising an input port, an output port, an R.F. amplifier for amplifying an R.F. signal supplied to the input port so as to provide a net gain greater than unity at the output port relative to the input port, a phase-shifter for introducing a controllable phase shift between the input port and the output port, and phase-control means including means for generating within the system a plurality of signals corresponding respectively to selected operational reference relative phases, means for selecting individually said operational reference relative phases, means for detecting a difference between the phase at the output port relative to the phase at the input port and relative to a selected operational reference relative phase, and for controlling the phase-shifter so as to tend to minimize said difference relative to said selected one of said operational reference relative phases, said selected operational reference relative phases being selectable from a plurality of substantially different discrete values, whereby to provide a selectable substantially constant phase shift from the input port to the output port, a predetermined phase shift being selectable so as to produce at the output port any one of said plurality of different relative phases spaced approximately at desired intervals, the operational reference relative phases being nominally respectively equal to said different relative phases, in operation, the phase-control means controls the phase-shifter with a control signal derived by addition of two quantities, a first of said quantities being a control quantity for causing the phase-shifter to introduce a predetermined phase shift between the input port and the output port and the second quantity being an error function representative of said difference and, for small values thereof, being a monotonically varying function, said phase control means further includes means for generating a plurality of error functions, respectively representative of the difference between the relative phase at the output port and each of said substantially different discrete values for the operational reference relative phase, and further includes means for selecting one of the error functions for controlling the phase-shifter.

4,533,874

DIGITAL FSK DEMODULATOR USING NON-RECURSIVE TRANSVERSAL FILTER

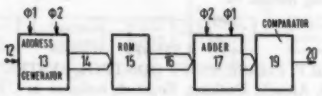
Reinhard Fischer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,479

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121444

Int. Cl.[3] **H03D** *3/00;* **H03K** *9/06;* **G06F** *7/544*

U.S. Cl. 329—50 **5 Claims**



1. Method for demodulating FSK signals having a transmission speed range, in which zero crossings of the FSK signals are detected and processed further in an FSK demodulator including an address generator having an input side and a memory having a memory input side connected to the address generator, which comprises delivering the FSK signals to said input side of the address generator, controlling the address generator with a given system clock frequency, supplying necessary address sequences from the address generator to the memory for the process of reading out pulse responses from the memory, thereby reading out time-sequential values of a pulse response stored in the memory having a given duration which emulate the output of a digital non recursive transversal filter having a lowpass transfer characteristic in response to an input pulse to the filter of a given duration; the address generator supplying said necessary address sequences for sequentially supplying a respective address of said address sequences for each respective zero crossing to said memory input side, which generates sequentially any value for the given duration which is necessary for reading out the pulse responses from the memory and which further generates an address for a rest value after the completion of the read out process said FSK demodulator further including an adder for summing up pulse responses read out from the memory during a given system clock period.

4,533,875

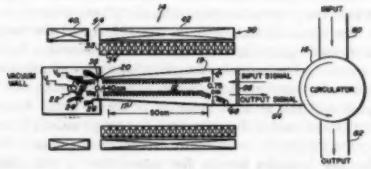
WIDE-BAND GYROTRON TRAVELING-WAVE AMPLIFIER

Yue-Ying Lau, 10612 Edgewood Ave., Silver Spring, Md. 20906; Kwo R. Chu, 4916 Andrea Ave., Annandale, Va. 22003; Victor L. Granatstein, 12816 Bluet Lane, Silver Spring, Md. 20906, and Larry R. Barnett, 8221 Erika Dr., Manassas, Va. 22111

Filed Jun. 16, 1982, Ser. No. 389,133

Int. Cl.[3] **H01S** *1/00;* **H01J** *23/08*

U.S. Cl. 330—4 **5 Claims**



1. A wide-band gyrotron traveling wave amplifier comprising:

a tapered waveguide wherein the cross-section thereof gradually increases from a small first end thereof to a larger second end for propagating electromagnetic energy therein;

means for generating a beam of relativistic electrons with helical electron motion, and applying this beam to said small first end of said tapered waveguide to propagate in the axial direction therein;

means for generating a tapered magnetic field B within said waveguide in a direction approximately parallel to the axis of said waveguide with a profile closely in accordance with the following equation:

$$\frac{B}{B_o}=\frac{\gamma_{zo}\beta_{\perp o}^2\lambda_{wo}^2}{2\lambda_w^2}\left[1+\left(1+\frac{4\lambda_w^2}{\gamma^2\gamma_{zo}^2\beta_{\perp o}^4\lambda_{wo}^2}\right)^{\frac{1}{2}}\right]$$

where

B_o is the axial magnetic field at the small first end,

$\gamma=(1-V_\perp^2/C^2-V_z^2/C^2)^{-\frac{1}{2}}$

$\gamma_{zo}=(1-V_{\perp o}^2/C^2-V_{zo}^2/C^2)^{-\frac{1}{2}}$

$\beta_{\perp o}$ is the electron velocity perpendicular to the magnetic field at the small first end of the waveguide divided by c,

λ_w is the cutoff wavelength of said tapered waveguide,

λ_{wo} is the cutoff wavelength of said tapered waveguide at the small first end thereof,

$V_\perp$ is the electron velocity perpendicular to the waveguide axis,

$V_{\perp o}$ is the electron velocity perpendicular to the waveguide axis at the small first end of said waveguide;

V_z is the electron velocity parallel to the waveguide axis,

V_{zo} is the electron velocity parallel to the waveguide axis at the small first end of said waveguide; and

means for launching an input electromagnetic wave at said larger second end of said waveguide to propagate toward said small first end such that the frequencies in the input wave will be reflected at various points along the constriction of said tapered waveguide so that they copropagate with said electron beam and are amplified thereby.

4,533,876

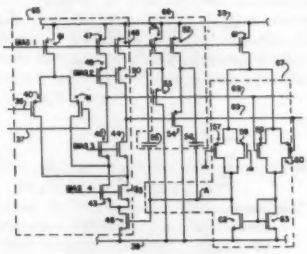
DIFFERENTIAL OPERATIONAL AMPLIFIER WITH COMMON MODE FEEDBACK

Yusuf Haque, San Jose, Calif., and Erwin Ofner, Graz, Austria, assignors to American Microsystems, Inc., Santa Clara, Calif.

Filed Oct. 18, 1983, Ser. No. 543,194

Int. Cl.[3] **H03F** *3/16, 3/45*

U.S. Cl. 330—253 **11 Claims**



1. A differential operational amplifier having automatic means for controlling common mode output voltage levels, comprising:

a differential operational amplifier for receiving two input signals and amplifying the difference, said operational amplifier having two input lines for receiving said two input signals and having two output lines for presenting the amplified difference between said two input signals;

a feedback circuit connected to said two output lines of said differential operational amplifier, said feedback circuit including means for generating a reference voltage representative of the desired common mode feedback voltage, and further including means for comparing the instantaneous common mode voltage on said output lines with said reference voltage, the difference between said desired common mode voltage and said instantaneous common mode voltage constituting an error signal, said error signal being communicated on a feedback line to the differential operational amplifier to adjust the instantaneous common mode voltage towards the desired common mode voltage; and

frequency compensation means in electrical communication with said feedback circuit and said differential operational amplifier to allow said error signal to possess negative feedback stability.

4,533,877

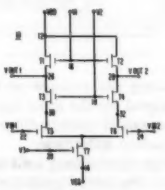
TELECOMMUNICATION OPERATIONAL AMPLIFIER

Chowdhury F. Rahim, Bridgewater, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1983, Ser. No. 566,822

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—253 **1 Claim**



1. An amplifier comprising:

first and second load devices each having first and second terminals;

third and fourth cascode switching devices each having a control terminal and first and second terminals;

fifth and sixth differential switching devices each having a control terminal and first and second terminals;

a current source coupled by a first terminal to the second terminals of the fifth and sixth differential switching devices;

the control terminals of the differential pair of switching devices being coupled to first and second amplifier input terminals, respectively;

the second terminals of the first and second load devices being coupled to the first terminals of the third and fourth cascode switching devices, respectively, and being adapted to be coupled to first and second amplifier output terminals, respectively;

the second terminals of the third and fourth cascode switching devices being coupled to the first terminals of the fifth and sixth differential switching devices, respectively;

each of the first, second, third, fourth, fifth, and sixth devices comprising a separate field effect transistor having a gate terminal corresponding to the control terminal, and having first and second terminals corresponding to the first and second terminals of the devices;

the first and second transistors being n-channel or p-channel transistors and the third, fourth, fifth, and sixth transistors being of the opposite channel type of the first and second transistors;

the first terminals of the first and second transistors being coupled together and being adapted to be connected to a first power supply;

the gate terminals of the first and second transistors being coupled together and being adapted to be connected to a first reference potential;

the gate terminals of the third and fourth transistors being coupled together and being adapted to be connected to a second reference potential;

the current source comprising a seventh field effect transistor of opposite channel type as the first and second transistors, and having a gate terminal and first and second terminals;

the first terminal of the seventh transistor being coupled to the second terminals of the fifth and sixth transistors;

the second terminal of the seventh transistor being connectable to a second power supply;

the gate terminal of the seventh transistor being connectable to a third reference potential;

the first, second, and third reference potentials being generated by first, second, and third reference sources which each comprise field effect transistors;

and wherein each of the first, second, and third reference sources comprises n-channel and p-channel transistors and the amplifier and all three reference sources are fabricated in a single semiconductor chip and each of the three reference sources and the amplifier are connectable to the same first and second power supplies.

4,533,878

AMPLIFIER COMPRISING ECL LOGIC GATE BIASED BY ANOTHER ECL LOGIC GATE

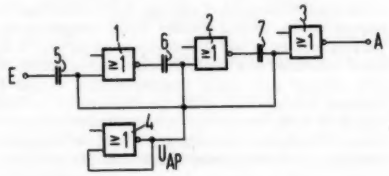
Hans Rehm, Munich, and Horst Breitenfeld, Gauting, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,150

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212188

Int. Cl.³ H03F *3/195, 3/45*

U.S. Cl. 330—261 **6 Claims**



1. A circuit for amplifying electrical signals in a device for transmitting frequency-modulated emitter coupled logic (ECL) signals via coaxial lines, said circuit comprising:

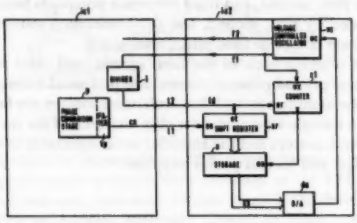
at least one amplifier stage formed by an ECL logic element, said amplifier stage having an input directly connected to a bias voltage source and capacitively connected to a signal voltage source; and

a further ECL logic element functioning as said bias voltage source, said further ECL logic element having an output and an input directly connected together, said ECL logic element forming said amplifier stage and said ECL logic element functioning as said bias voltage source being identical logic elements and components of a single ECL module.

4,533,879
INTEGRATED CIRCUIT KIT WITH A PHASE-LOCKED LOOP FOR COLOR TELEVISION RECEIVERS

Wolfgang Sauer, Freiburg; Friedrich Schmidtpott, Gundelfingen; Hermanus Schat, Freiburg, and Laurin C. Freyberger, Bahlingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 27, 1983, Ser. No. 536,287
Claims priority, application 10221982, Oct. 22, 1982, 82109740.9
Int. Cl.³ H03L 7/00
U.S. Cl. 331—1 A 7 Claims



1. An IC kit for a color-television receiver with digital signal processing comprising first and second integrated circuits which jointly contain a clock oscillator realized in the form of a phase-locked loop for producing two-phase clock signals;

said first integrated circuit containing a phase-comparison stage said second integrated circuit containing a voltage-controlled oscillator of the phase-locked loop, control signals for said phase-locked loop being applied via a maximum of two connecting lines between said first and said second integrated circuits, characterized in that:

said phase-comparison stage comprises a digital low-pass filter at its output;

said control signals are digital signals applied to said second integrated circuit by said first integrated circuit via a first one of said connecting lines; and

said second integrated circuit comprising a first counter for counting a first one of said clock signals, and having a reset input connected to a second one of said connecting lines for receiving data clock signals during said control signals,

a shift register having parallel outputs and having a clock input to said second one connecting line, and having a serial input connected to the said first connecting line;

a storage device having parallel inputs connected to said parallel outputs of said shift register and having an enable input connected to a single counter-reading output of said first counter said single counter-reading output being selected in accordance with the relationship $X/F \geq 1/Fd$ where X is the numerical value corresponding to said output, F indicates the frequency of said clock signals, and Fd indicates the frequency of said data clock signals; and

a digital-to-analog converter having inputs connected to the outputs of said storage device, and having an output connected to the control input of the oscillator.

4,533,880
TUNING CIRCUIT WITH FREQUENCY SYNTHESIZER USING D/A CONVERTER

Martinus F. A. M. Geurts, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,784
Claims priority, application Netherlands, Sep. 25, 1981, 8104415
Int. Cl.³ H03L 7/06
U.S. Cl. 331—1 A 2 Claims

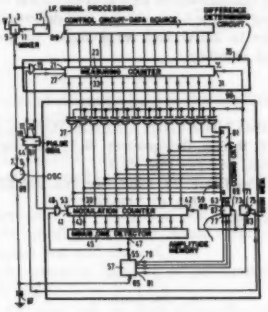
1. A frequency synthesis tuning circuit comprising:

an oscillator having a frequency control input;

a source of data specifying a tuning frequency;

a digital frequency determining means for receiving said data specifying a tuning frequency and a signal from said oscillator, and producing a multiple bit digital frequency error signal having bits of most and least significance, proportional to the frequency difference between said oscillator output signal and the frequency specified by said data; and,

modulator circuit means for generating a periodic pulse signal representing said frequency difference for controlling said oscillator, said modulating circuit means including:



means for modulating the average pulse duration of said periodic pulse signal by the most significant bits of said error signal when said frequency difference is greater than a minimum frequency difference;

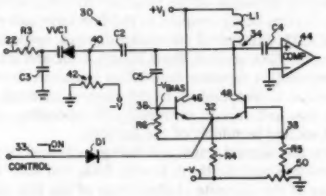
means for amplitude modulating said modulated periodic pulse signal with the least significant bits of the digital error signal when said frequency difference is less than a maximum frequency difference; and

means for amplitude and pulse duration modulating said periodic pulse signal with the most and least significant bits of said digital frequency error signal when said frequency difference is between said maximum and minimum frequency differences.

4,533,881
RAPID STARTING VARIABLE FREQUENCY OSCILLATOR WITH MINIMUM STARTUP PERTURBATIONS

Michael R. Monett, Santa Clara, Calif., assignor to Memory Technology, Inc., Santa Clara, Calif.

Filed Sep. 3, 1982, Ser. No. 414,749
Int. Cl.³ H03L 7/00; H03B 5/08
U.S. Cl. 331—36 C 5 Claims



1. An oscillator circuit capable of minimizing frequency perturbations during starting up of said oscillator circuit, said oscillator circuit comprising:

a resonant tank circuit having a central node, said resonant tank circuit comprising at least one voltage variable capacitor and an inductor, said inductor having a first terminal and a second terminal, said first terminal being DC

coupled to a fixed voltage source and coupled to said voltage variable capacitor, and said second terminal being DC coupled to said central node and coupled to said voltage variable capacitor;

means for providing positive feedback to said resonant tank circuit, said positive feedback providing means including first and second switching means, said first switching means comprising a first transistor, and said second switching means comprising a second transistor, said first transistor and said second transistor forming a differential pair having a common emitter node, said second transistor having a collector node coupled to said central node, said first transistor having a first base electrode and said second transistor having a second base electrode; and

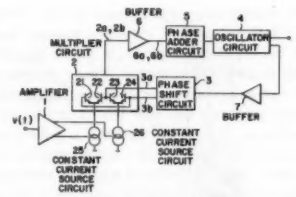
bias circuit means, said bias circuit means being coupled to said second base electrode to maintain a current bias and to said first base electrode to maintain a current bias, said bias circuit means including charge storage means coupled between said first base electrode and said central node to allow voltage at said second electrode to track voltage changes at said central node such that said bias circuit means maintains a controlled DC bias level at said central node at least during starting up of said oscillator circuit, thereby maintaining constant voltage bias of said voltage variable capacitor.

4,533,882

FREQUENCY MODULATOR WHEREIN MODULATION TAKES PLACE IN A FEEDBACK LOOP OF AN OSCILLATOR

Seitaro Shinbara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 13, 1984, Ser. No. 579,458
Claims priority, application Japan, Feb. 16, 1983, 58-24323
Int. Cl.³ H03C *3/02*
U.S. Cl. 332—16 T **5 Claims**



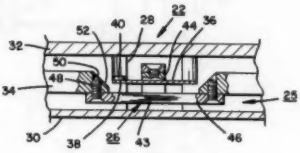
1. A frequency modulator comprising an oscillator circuit including an amplification element, a phase shift circuit for phase-shifting an oscillation output of said oscillator circuit by the amount of 90 degrees, a multiplier circuit including an amplification element and multiplying an output of said phase shift circuit by a modulating signal, and a phase adder circuit for varying an oscillation frequency of said oscillator circuit by adding the output of said multiplier circuit, wherein the amplification element of said phase adder circuit and the amplification of said oscillator circuit are connected in parallel with respect to a power source, and said multiplier circuit comprises an amplification element connected to receive the output of said phase shift circuit, and a constant current source circuit connected in series with said amplification element of said multiplier circuit and varying the magnitude of a current passing through said amplification element of said multiplier circuit in accordance with said modulating signal.

4,533,883

COAXIAL TRANSMISSION LINE CROSSING

Thomas Hudspeth, Malibu, and Harmon H. Keeling, Lake Isabella, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Feb. 23, 1983, Ser. No. 468,827
Int. Cl.³ H01P *3/06*
U.S. Cl. 333—1 **9 Claims**



1. A crossover for a microwave circuit comprising:

(a) a plate of electrically conductive material having channels therein for communication of microwave energy, the path of a first of said channels crossing the path of a second of said channels;

(b) a first and a second inner conducting means disposed respectively within said first and said second channels and electrically insulated from the walls of said channels;

(c) an electrically conductive septum disposed at the crossing of said paths;

(d) means within said first conducting means for depressing said first conducting means below said septum; and

(e) means within said second conducting means for elevating said second conducting means above said septum to provide isolation in the conduction of microwave energy through said crossover along said first and said second conducting means.

4,533,884

COAXIAL LINE TO WAVEGUIDE ADAPTER

Thomas Hudspeth, Malibu, and Harmon H. Keeling, Lake Isabella, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Feb. 23, 1983, Ser. No. 468,825
Int. Cl.³ H01P *5/103*
U.S. Cl. 333—26 **6 Claims**

1. An adapter of a coaxial transmission line to a waveguide comprising:

(a) a microwave circuit disposed within a plate of electrically conductive material, said circuit including coaxial transmission lines formed of rectangular channels cut into said plate and rod-shaped inner conductors of rectangular cross-section;

(b) a cover of electrically conductive material set on said plate and closing off said channels to complete the outer conductor of said coaxial transmission lines;

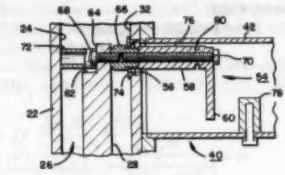
(c) an aperture in the outer conductor adjacent to one of said transmission lines;

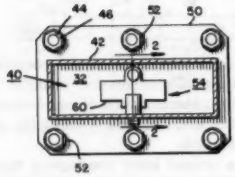
(d) a waveguide located at said aperture and secured to the outer conductor of said one transmission line;

(e) a mode launcher extending from the inner conductor of said one transmission line through said aperture and into said waveguide to couple said inner conductor via said aperture to said waveguide; and

(f) said mode launcher comprising a stem passing adjacent an inner wall of said waveguide but spaced apart therefrom for transporting a transverse electromagnetic wave, and wherein said mode launcher includes a dipole element of

planar shape disposed within said waveguide and normal to the propagation axis of said waveguide, said dipole





element being supported at an edge thereof by a terminus of said stem.

4,533,885

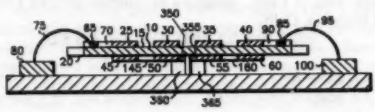
APPARATUS FOR SUPPRESSION OF SPURIOUS ATTENUATION POLES IN CRYSTAL FILTERS

Robert J. Higgins, Jr., Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 27, 1983, Ser. No. 488,874

Int. Cl.³ H03H *9/56, 9/58, 9/05*

U.S. Cl. 333—191 **11 Claims**



1. A piezoelectric filter, comprising:

a piezoelectric substrate including upper and lower opposed major surfaces;

a plurality of N electrically cascaded resonators disposed on said piezoelectric substrate where N is an integer greater than two, each of said resonators including a lower electrode disposed on said lower major surface and each resonator in said cascade along with its corresponding electrodes being assigned a consecutive ordinal integer such that adjacent resonators and their associated adjacent lower electrodes are assigned numbers differing by one; and

a plurality of at least INT (N+1)/2 mounting pedestals each electrically coupled to certain of said lower electrodes so that a maximum of two adjacent lower electrodes are coupled to any of said pedestals, at least one pair of two adjacent lower electrodes are connected to one of said pedestals.

4,533,886

SELF-BIASING BROADBAND FREQUENCY DIVIDER

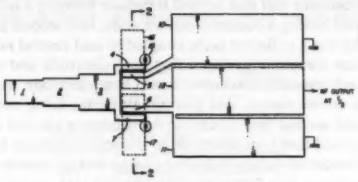
William D. Cornish, Nepean, and Lawrence B. Hewitt, Calgary, both of Canada, assignors to Minister of National Defence, Canada

Filed Dec. 23, 1982, Ser. No. 452,505

Claims priority, application Canada, May 14, 1982, 403007

Int. Cl.³ H01P *1/20*

U.S. Cl. 333—218 **4 Claims**



1. In a microstrip transmission line frequency divider having a circuit resonant at a sub-harmonic frequency with a pair of input lines coupled to a pair of output lines, each input line terminating in a varactor diode connected between it and the ground plane, the improvement comprising the ground plane defining a pair of slots located at the resonant circuit, each slot being separated from the other and generally located underneath one input line and its associated output line, adjacent a varactor and extending laterally outwardly, whereby the varactors are biased into forward conduction.

4,533,887

ROTARY WAVEGUIDE COUPLING HAVING ARCUATE SHAPED DEFLECTING ELEMENTS WITH 2-D BLOCKING STRUCTURES

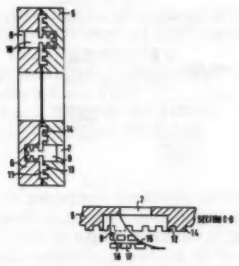
Günter Mörz, Ludwigsburg, and Werner Speldrich, Backnang, both of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,203

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209906

Int. Cl.³ H01P *1/06*

U.S. Cl. 333—256 **19 Claims**



1. A rotary waveguide coupling comprising:

an annular waveguide divided along a separating plane to form first and second annular waveguide sections connected together so as to be mutually rotatable, said first annular waveguide section having a waveguide input port and said second annular waveguide section having a waveguide output port; and

first and second deflecting means each fixedly disposed in a respective one of said first and second annular waveguide sections at a respective one of said input and output ports for imparting a defined direction of propagation to waves fed to said annular waveguide at said input port and for

guiding waves out of said annular waveguide at said output port with a defined direction of propagation, each said deflecting means including a deflecting element comprising a molded part which is bent in the form of a hook to define an arcuate surface extending from the waveguide section in which that deflecting element is fixedly disposed into the other waveguide section without contacting the walls of said other waveguide section, each said molded part having a surface, separate from said arcuate surface, extending into said other waveguide section and being provided with a plurality of orthogonal grooves which define a plurality of projections between said grooves, said grooves and projections constituting a two-dimensionally oriented wave blocking structure.

4,533,888

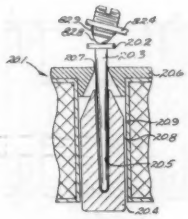
MAGNETIC CIRCUIT CONTROL APPARATUS

Aimé J. Grenier, North Attleboro, and Lyle E. McBride, Norton, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 395,167, Jul. 6, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,443

Int. Cl.³ H01H *50/66*

U.S. Cl. 335—131 **9 Claims**



1. Magnetic circuit control apparatus comprising first and second load contact assembly means, the first load contact assembly means being movable relative to the second load contact assembly means between a contacts engaged and contacts disengaged position, solenoid means having an output stroke to move one of the first and second contact assembly means comprising a winding configured as an annulus, side wall means defining a core receiving bore located within the annulus, the bore having a longitudinal axis, a core of magnetically responsive material movable along the longitudinal axis within the annulus between first and second positions, the core having an upper and a lower end and having a bore extending along essentially the whole length of the longitudinal axis and being open at its upper end and closed at its lower end, the bore in the core having a generally frusto-conical configuration with the bore being larger at its open end than adjacent the closed end, a detached elongated output element loosely received in the bore and projecting therefrom, the output element operatively coupled to the first load contact assembly to move it relative to the second load contact assembly, and pole piece means having a bore extending therethrough, the elongated element projecting through the bore in the pole piece means, the diameter of the bore in the pole piece being selected to allow rocking movement of the elongated element within the bore of the core but to limit lateral movement of the core to prevent the upper end portion of the core from striking the side wall as it moves between the first and second positions.

4,533,889

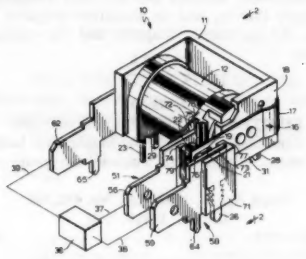
RELAYS AND METHOD FOR MOUNTING RELAYS ON PRINTED CIRCUIT BOARDS

Michael W. Knight, Fort Branch, Ind., assignor to AMF Incorporated, White Plains, N.Y.

Filed Dec. 14, 1983, Ser. No. 560,903

Int. Cl.³ H01H *47/04*

U.S. Cl. 335—199 **23 Claims**



22. A relay adapted to be mounted to a printed circuit board, said relay including a plurality of contacts (**19, 21, 22**) adapted to be electrically connected to a load, characterized in that said relay further includes a first terminal means (**56, 59, 62, 82, 92**) for electrically connecting said contacts (**19, 21, 22**) to a load (**36**) external of and bypassing any conducting paths on said printed circuit board (**30**), and second terminal means (**26, 27, 28, 29**) for mounting said relay to said printed circuit board (**30**) and for electrically connecting said contacts (**19, 21, 22**) to conducting paths on said printed circuit board (**30**).

4,533,890

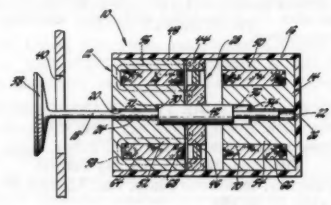
PERMANENT MAGNET BISTABLE SOLENOID ACTUATOR

Balkrishna R. Patel, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1984, Ser. No. 685,547

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—234 **2 Claims**



1. A bistable electromagnetic actuator comprising in combination:

first and second ferromagnetic core elements disposed in spaced relation within a housing member, the first and second core elements having axially opposed inner and outer extensions defined in each core element by a central axial opening and an axial annular recess in which is received an electrical coil;

an armature assembly including a nonmagnetic actuator shaft disposed within the central opening of each core and supported thereby for axial movement therein, and inner and outer axially magnetized annular permanent magnets of opposite polarity radially spaced by a ferromagnetic ring so as to be axially aligned with the inner and outer extensions of the first and second core elements, the mag-

nets and ring being secured to the actuator shaft for axial movement therewith so that the magnets are effective when in close proximity to the first core element to hold the actuator shaft in a first axial position and when in close proximity to the second core element to hold the actuator shaft in a second axial position; and so that,

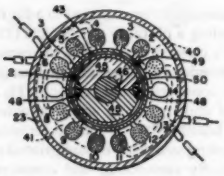
the electrical coils are momentarily energizable with electrical current to produce a repulsive magnetic force between the permanent magnets and the core element in close proximity thereto, and an attractive magnetic force between the permanent magnets and the opposing core element.

4,533,891

LIMITED ANGLE TORQUE MOTOR

Robert D. Vanderlaan, and John W. Meulendyk, both of Kalamazoo, Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Apr. 7, 1983, Ser. No. 482,769
Int. Cl.³ H01F *7/08*
U.S. Cl. 335—272 **10 Claims**



1. A limited angle torque motor comprising a rotor assembly, a rotor casing surrounding said rotor assembly, and a stator assembly extending over one end of said rotor casing, said rotor casing being closed at said one end and open at its other end to permit operating fluid to enter said rotor casing through said other end, and connecting means for removably connecting said stator assembly to said rotor casing thereby permitting replacement of said stator assembly without distrubing said rotor assembly, said rotor casing having an external shoulder adjacent said other end engageable by a holddown member which is used to attach said rotor casing to a support structure, and said connecting means comprising a sleeve member for connecting said stator assembly to said holddown member.

4,533,892

SPLIT STRUCTURE TYPE TRANSFORMER

Hideki Masuhara; Kunio Katada, and Uichi Kudo, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,515
Claims priority, application Japan, Jun. 23, 1982, 57-106681; Aug. 25, 1982, 57-147189
Int. Cl.³ H01F *21/12*
U.S. Cl. 336—147 **9 Claims**

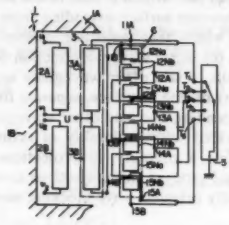
1. A split structure type transformer comprising:

a core having a leg;

two split secondary windings wound about the leg of the core to be juxtaposed along an axial direction of the leg, and connectable to independent loads;

a primary winding including two primary winding parts each being wound about each of said two secondary windings corresponding thereto and concentrically therewith to be juxtaposed along the axial direction of said leg said two primary winding parts being connected in parallel to each other;

a single tap winding wound about both the primary winding parts of said primary winding and secondary windings concentrically therewith and including a plurality of tap winding parts connected in series with each other and a plurality of tap terminals, only one end of said single tap winding is connected to a common terminal of the parallel connected primary winding parts so that a sum of currents



flowing through said two primary winding parts is applied to said one end of said single tap winding; and

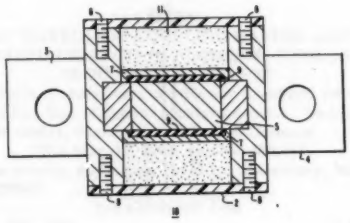
a single tap selector connected to the tap terminals of said single tap winding to select one of the tap terminals.

4,533,893

MONOLITHIC FUSE FOR ROTATING EQUIPMENT

Donald D. Blewitt, Penn Hills, and Tapan K. Gupta, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 13, 1984, Ser. No. 570,489
Int. Cl.³ H01H *85/00*
U.S. Cl. 337—5 **6 Claims**



1. A fuse, comprising:

(a) an insulating fuse housing;

(b) electrically conductive terminal means disposed at both ends of said fuse housing for sealing the ends thereof;

(c) a non-linear resistor means is electrically connected to and extends continuously between the electrically conductive terminal means within said insulating fuse housing for limiting and shaping the arc voltage developed during current interruption; and

(d) a fuse element electrically connected between the electrically conductive terminal means and metallurgically deposited on the non-linear resistor means within the insulating fuse housing.

4,533,894

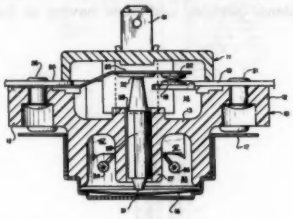
ADJUSTABLE BIMETAL SNAP DISC THERMOSTAT WITH HEATERS

Ralph L. Bishop; William N. Rich, and Walter C. Kowalski, all of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Jun. 18, 1984, Ser. No. 621,665
Int. Cl.³ H01H *61/02, 37/52*
U.S. Cl. 337—107 **13 Claims**

1. A bimetal snap disc thermostat comprising a body assembly, a switch in said body assembly, a bimetal snap disc mounted on said body assembly, an operator operating said switch in response to snap movement of said bimetal disc, said

disc and body assembly cooperating to define a heater chamber adjacent to said disc, a plurality of separate generally cylindrical resistance heaters symmetrically positioned in said heater chamber adjacent to said bimetal disc, and a pair of heater



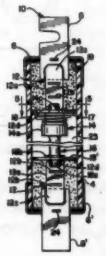
terminals mounted on said body assembly having inner ends in said heater chamber, said heaters providing leads extending from the ends thereof connected to said heater terminals, said heater terminals through said leads operating to position said heaters within said annular chamber.

4,533,895

TIME DELAY FUSE

Joseph W. Kowalik, Skokie, and David J. Krueger, Arlington Heights, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Filed Jun. 22, 1984, Ser. No. 623,824
Int. Cl.³ H01H *71/20*
U.S. Cl. 337—165 **28 Claims**



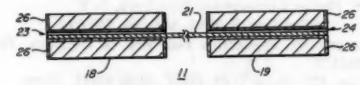
1. In a time delay fuse having an insulating housing with conductive terminals at the opposite axial ends thereof, and a subassembly including axially disposed first current-heatable means connected to one of said terminals and current-carrying means electrically coupled in series between said first current-heatable means and the other terminal to complete a circuit between said terminals, said first current-carrying means including a member axially movable above a given temperature and coupled to said first current-heatable means through a heat meltable connection, spring means for urging said axially movable member in an axial decoupling direction away from said first current-heatable means to separate and decouple the current-carrying means from said first current-heatable means so that upon the melting of said heat meltable connection said current-carrying means is separated and decoupled from said first current-heatable means, said heat meltable connection being in heat coupled relation to said first current-heatable means so that a prolonged modest overload of current flow through said first current-heatable means over a given time period will at least soften said heat meltable connection; the improvement wherein said spring means includes an axially compressed spring having one axial end which bears against a first axially facing shoulder on said axially movable member to urge said axially movable member in said decoupling direction, and spring holding means for holding said spring means in an axially compressed state, said holding means including a spring holding member initially axially movable relative to said first current-heatable means so as to allow placement of said holding member at a given relative axial position where said holding member bears against and compresses said spring means, and lockable into said given axial position when rotated relative to said subassembly in a transverse plane where it is held by spring force in position against a second shoulder in said housing.

4,533,896

FUSE FOR THICK FILM DEVICE

Yakov Belopolsky, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 28, 1983, Ser. No. 555,339
Int. Cl.³ H01H *85/16*
U.S. Cl. 337—232 **9 Claims**



1. A fuse, for mounting on an electrically insulative substrate to protect a thick film device mounted on said substrate and connected electrically in series with said fuse, said fuse characterized by:

two electrically conductive terminal block means, for electrical connection to electrodes carried by said substrate, said two block means in close proximity to one anther, in axial alignment, but in a spaced apart relationship; and

an electrically conductive fusible link means protruding into respective mating holes in each of said two terminal block means and electrically connected thereto so as to complete an electric circuit between said two block means whereby said mating holes are larger than necessary to accept said fusible link, so as to allow molten material from the fusible link to move into said mating holes due to capillary action when said fusible link melts due to excessive heat.

4,533,897

MINIATURE THERMAL SWITCH AND METHOD OF MAKING THE SAME

Harry W. Olson, Woodridge, and Phillip A. Olson, Hoffman Estates, both of Ill. (legal representative of said Harry W. Olson, deceased), assignors to Littelfuse, Inc., Des Plaines, Ill.

Filed Apr. 28, 1983, Ser. No. 489,342
Int. Cl.³ H01H *37/76*
U.S. Cl. 337—408 **17 Claims**

1. A thermally actuated electrical switch for permanently breaking an electrical connection responsively to a rise in the ambient temperature therearound above a given threshold temperature, said switch comprising:

an insulating housing having an interior compartment defined by the walls thereof:

first and second electrically conducting elongated contact members having outer ends thereof emerging from said housing, said conducting members having their interior ends disposed within the interior of said housing, the interior end of said first contact member being mechanically deflected towards and against the interior end of said second contact member to complete a circuit through said switch;

spring means disposed within said housing and on one side of the interior ends of said contact members and pressingly urging said first contact member against said second contact member in a given direction; and

a solid meltable arresting member disposed within said hous-

ing on the other side of the interior ends of said contact members for arrestingly supporting one of said contact members against the force of said spring means acting in said given direction to maintain electrical contact between the contact members, said meltable arresting member having its melting point at said given threshold temperature, so that said arresting member melts at said threshold temperature to release said one of said contact members to separate from the other contact member under the force of said spring means in said given direction, and wherein said interior end of said second contact member is rigidly supported by and urged by said spring means against a sloping interior portion of said housing, so as to be pushed by said spring means along and beyond said first contact member when said arresting member melts.

4,533,898

SYMMETRICAL TEMPERATURE SENSOR

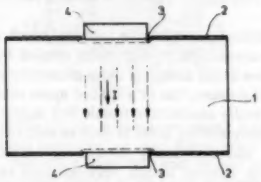
Heinz Sauermann, Halstenbek, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,412

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1982, 3245178

Int. Cl.³ G01K *7/22;* **H01C** *7/08;* **H01L** *37/00*

U.S. Cl. 338—25 **3 Claims**



1. A symmetrical temperature sensor, which comprises:

a semiconductor body of one conductivity type comprising neutron-transmuted n-type silicon;

two highly-doped zones of said conductivity type and formed opposite each other on opposite surfaces of said semiconductor body, the thickness of said zones being substantially less than that of said semiconductor body, a temperature-dependent resistor being formed in said body between said two zones; and

connection contacts connected to said two highly-doped zones.

4,533,899

JOYSTICK CONTROLLER WITH IMPROVED MOTION CONTROL WITH PLATE HAVING BEVELLED FLAT EDGES THAT CORRESPOND TO PLANES OF MANEUVERABILITY

Karl Isaksson, Eslöv, Sweden, assignor to Akermans Verkstad AB, Eslov, Sweden

Filed Dec. 15, 1983, Ser. No. 561,914

Claims priority, application Sweden, Dec. 23, 1982, 8207373

Int. Cl.³ H01C *10/16;* **G05G** *9/10*

U.S. Cl. 338—128 **10 Claims**

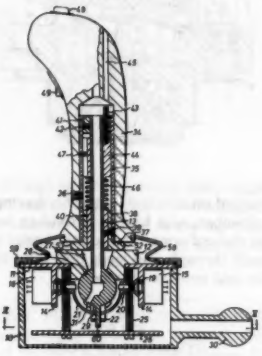
1. A control lever arrangement comprising in combination a housing,

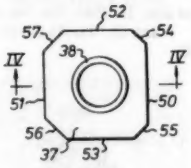
control means within said housing,

a lever non-rotatably mounted in said housing and projecting therefrom, said lever being manually movable in every direction from its initial position for actuating the control means within said housing, but being especially and distinctly movable in at least two planes forming an angle to one another and representing the operation of a specific function for which interference from adjacent functions is undesirable,

a plate non-rotatably but displaceably mounted on said lever, means forming a planar portion on said housing about the lever fulcrum therein,

a spring provided between said plate and a fixed abutment on said lever for holding said plate in planar engagement with said planar portion, said plate having at least two flat





edges forming the same angle with one another as the said distinct plane of lever movement and extending at right angles each to one of said planes, said plate being tiltable about said flat edges and substantially non-slidable along said planar portion against the action of said spring when said lever is moved for actuation of a desired control means.

4,533,900

SERVICE-INTERVAL DISPLAY FOR MOTOR VEHICLES

Heinz Muhlberger, Eching; Erwin Starmuhler, Munich; Walter Weishaupt, Munich; Peter Flohr, Munich, and Fritz Bourauel, Munich, all of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,764

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104196

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 R **12 Claims**

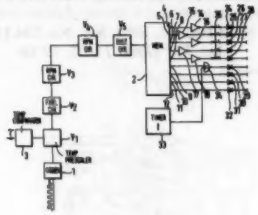
2. Apparatus for displaying a service-interval for a motor vehicle having an engine comprising:

measuring means for measuring actual distance travelled by the motor vehicle,

display means for generating a service signal indicative of a fixed service interval,

distance-modifying means interposed between the display means and the measuring means, said distance-modifying means being responsive to both a first component related to the actual distance travelled by the vehicle and a sec-

ond component being a function of a parameter of engine load for controlling the occurrence of said service signal

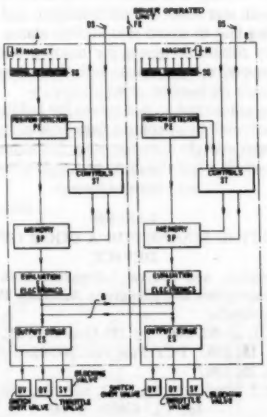


to assert earlier said service signal when said engine experiences increased periods of higher loads.

4,533,901
ANTICATCHING DEVICE FOR AUTOMATIC DOORS OR WINDOWS

Franz Lederle, Weichs, Fed. Rep. of Germany, assignor to Gebr. Bode & Co., Kassel, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 361,166
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111711
Int. Cl.³ H02P *1/04*
U.S. Cl. 340—52 R **10 Claims**

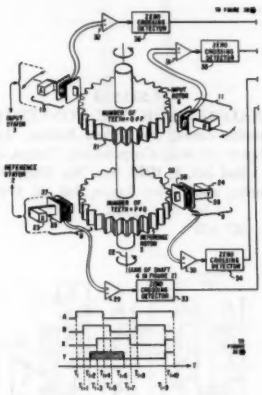


1. In an anticatching control device for automatic doors or windows of vehicles and the like, having an electric signal generator coupled with a movable member of a door or window mechanism to produce an electrical position signal every time the member reaches a predetermined position and circuit means receptive of the position signals for measuring the time interval between two consecutive signals and comparing same with given time intervals to produce a control signal when there is an unfavorable comparison to effect the stopping or reversing of the motion of the member, the improvement wherein the signal generator produces at least two position signals during the movement of the members between predetermined positions corresponding to selected segments thereof in the closing direction and in the opening direction and wherein the circuit means comprises means for storing previous measured time intervals for each segment for the closing direction and for the opening direction and means for comparing a current measured time interval to a previous measured time interval for that same segment and for the same direction to produce said control signal.

4,533,902
PRECISION ANGLE TRANSDUCER USING NONPRECISION ROTORS

Alan J. Baker, 10329 33rd Ave. SE., Everett, Wash. 98204, and Robert W. Leiby, 2024 W. Stuart, Fort Collins, Colo. 80526

Filed Mar. 25, 1983, Ser. No. 478,759
Int. Cl.³ H03K *13/02*; G08C *9/00*
U.S. Cl. 340—347 P **16 Claims**



1. A transducer comprising:

first and second rotors journalled for simultaneous and identical rotation about an axis, respectively having P-many and Q-many poles along respective first and second peripheries, P unequal to Q, and having respective first and second once-per-revolution index marks;

means coupled to the first and second rotors for rotating them about the axis;

first sensor means disposed adjacent the first periphery for producing a first sensor signal of P-many cycles per revolution in response to the passage of poles along the first periphery;

second sensor means disposed adjacent the second periphery for producing a second sensor signal of Q-many cycles per revolution in response to the passage of poles along the second periphery and journalled for orbital revolution about the axis and along the second periphery;

first and second zero crossing detectors respectively coupled to the first and second sensor signals for producing first and second digital signals;

transition detection means coupled to the first and second digital signals for detecting that at least one of those signals has changed;

clock means for providing digital time information;

means coupled to the first digital signal for distinguishing the first once-per-revolution index mark;

means coupled to the second digital signal for distinguishing the second once-per-revolution index mark;

first digital processing means coupled to the first and second digital signals, to the transition detection means, to the clock means and to those means for distinguishing the first and second once-per-revolution index marks, for determining the time of one revolution R of the rotors, the sum of the P-many times ΣT_P from a zero point to selected transitions in P-many consecutive cycles of the first digital signal, the sum of the Q-many times ΣT_Q from the zero point to selected transitions in Q-many consecutive cycles of the second digital signal, the number, according to the

modulus P, of intervening whole cycles $P_\#$ occurring in the first digital signal from a preceding first once-per-revolution index mark to the first of the P-many consecutive cycles, and for determining the number, according to the modulus Q, of intervening whole cycles $Q_\#$ occurring in the second digital signal from a preceding second once-per-revolution index mark to the first of the Q-many consecutive cycles; and

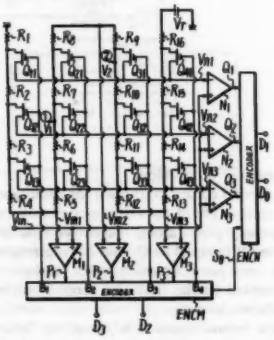
second digital processing means coupled to R, ΣT_P, ΣT_Q, $P_\#$ and $Q_\#$ for finding the phase θ between the first and second sensor signals.

4,533,903

ANALOG-TO-DIGITAL CONVERTER

Takaaki Yamada, Zama, and Takeo Sekino, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,499
Claims priority, application Japan, Jul. 10, 1981, 56-107656
Int. Cl.³ H03K *13/175*
U.S. Cl. 340—347 AD **15 Claims**



1. An analog-to-digital converter for converting an analog input voltage signal to a digital output voltage signal of m upper bits and n lower bits comprising:

a plurality of resistor means connected in a series circuit to a voltage source for establishing respective reference voltages;

upper bit comparators for generating outputs indicative of said m upper bits and having first inputs each receiving said analog input voltage and second inputs each connected to said series circuit at respective intervals defining groups of said resistor means therebetween, each of said groups including a plurality of resistor means;

upper bit encoder means receiving said outputs from said upper bit comparators for generating said m upper bits of said output signal and a switch control signal;

lower bit comparators for generating outputs indicative of said n lower bits and having first inputs each receiving said analog input voltage and second inputs;

switch means associated with each of said groups of said resistor means and being responsive to said switch control signal for selectively connecting each of said second inputs of said lower bit comparators to a respective resistor means in said associated group of resistor means; and

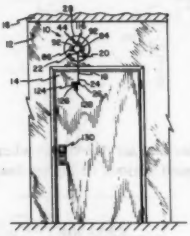
lower bit encoder means receiving said outputs from said lower bit comparators for generating said n lower bits of said digital output signal.

4,533,904

COMBINATION SMOKE AND BURGLAR ALARM

LeRoy F. Steinman, Jr., 516 Harbor Walk Dr., Fort Wayne, Ind. 46819

Filed Feb. 27, 1984, Ser. No. 584,117
Int. Cl.³ G08B *19/00, 13/08*
U.S. Cl. 340—521 **19 Claims**



10. A combination smoke and burglar alarm including a smoke alarm means having a housing, an audible alarm, means in said housing for sounding said audible alarm in response to detecting smoke, a test system having a spring-biased tester switch actuable externally of said housing by a user, and means controlled by said tester switch for sounding said audible alarm when said tester switch is actuated against its spring bias; said smoke and burglar alarm comprising:

a tester-switch actuator mounted externally on said housing;

means for biasing said tester-switch actuator into engagement with said tester switch to actuate said switch against its spring bias to sound said audible alarm;

selectively releasable means for holding said tester-switch actuator out of engagement with the tester switch against said means for biasing; and

trip means connected to said means for holding and adapted to be activated by opening a door or window for releasing said tester-switch actuator into engagement with said tester switch when the door or window is opened.

4,533,905

INDICATING MEANS FOR A DOOR OPERATOR DEVICE

Simon Leivenzon, and Steven Leivenzon, both of Caulfield, Australia, assignors to Firmagroup Australia Pty. Ltd., Cheltenham, Australia

PCT No. PCT/AU82/00077, § 371 Date Dec. 15, 1982, § 102(e) Date Dec. 15, 1982, PCT Pub. No. WO82/04094, PCT Pub. Date Nov. 25, 1982
PCT Filed May 14, 1982, Ser. No. 456,078
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—524 **14 Claims**

1. In an operator for a door,

(a) drive means for moving a door to which said operator is attachable from open to closed position and from closed position to open position;

(b) initiating means for initiating said drive means to effect such movements of said door;

(c) circuit means operatively interconnected between said drive means and said initiating means to permit such movement of said door and switching off of said drive means when a fully opened or fully closed positions is reached;

(d) at least said drive means, said initiating means and said circuit means being locatable, in the vicinity of said door;

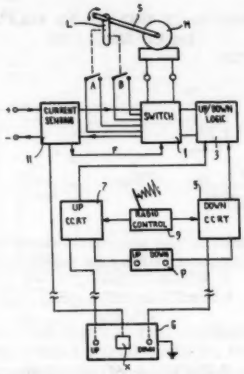
(e) second initiating means and door position indicator means locatable remote from said operator and remote from the vicinity of said door;

(f) said door position indicator means comprising an indicator for indicating the door fully closed position;

(g) said second initiating means initiating drive of said drive

means to effect at least a movement of said door to fully closed position;

(h) said indicator having two operative states, including a first state in which, when it is activated, it can give a fail



safe indication, and a second state in which, when it is not activated, it cannot give such indication;

(i) said door position indicator means comprising door movement indication means provided to give an indication that said door is moving between either position

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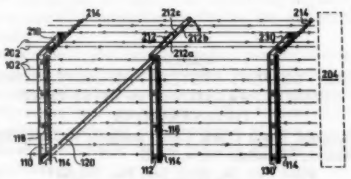
4,533,906

FENCE PARTICULARLY USEFUL FOR DETECTING INTRUSION ATTEMPTS

Yoel Amir, Moshav Omer, Israel, assignor to Beta Engineering & Development Ltd., Beer-Sheva, Israel

Filed Sep. 15, 1982, Ser. No. 418,583
Claims priority, application Italy, Nov. 2, 1981, 64190
Int. Cl.³ G08B *13/12*
U.S. Cl. 340—541 **10 Claims**



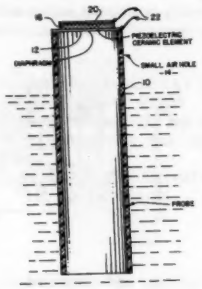
1. A wire fence including a plurality of trip-wires tensioned between ground-anchoring means at their opposite ends and connected to detector means actuated upon the disturbance of the trip-wires, characterized in that said ground-anchoring means comprises a pair of anchoring posts anchorable in the ground in spaced parallel relationship, and a diagonal post secured to said anchoring posts so as to extend at an incline therebetween with respect to the ground, said trip-wires being secured to said diagonal post and being longitudinally freely movable with respect to said anchoring posts, thereby increasing the difficulty of one attempting to climb over the fence by depriving him of a substantially horizontal foot-engaging surface and a good hand-gripping support, the weight of one attempting to climb the fence producing a large displacement of the trip-wires secured to the diagonal post thereby better assuring that the trip-wires will actuate the detector.

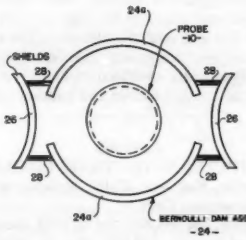
4,533,907

SWIMMING POOL ALARM

John B. Thatcher, 4410 Hedge Court, Rohnert Park, Calif. 94928

Filed May 9, 1983, Ser. No. 492,577
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—565 **5 Claims**





1. A swimming pool alarm assembly including: a hollow elongated tubular probe adapted to be set in an upright position in the water of a swimming pool with its lower end extending below the surface of the water in the pool; a diaphragm mounted across the top of the probe to close the top; the tubular probe having an open bottom so that water rises in the probe to trap a quantity of air in the upper end thereof; a pressure responsive electrical transducer mounted on said diaphragm for generating voltages in response to stresses exerted on the transducer by movement of the diaphragm; an electrically activated alarm unit; electronic circuitry connected to said transducer and to said alarm unit to activate said alarm in response to voltages generated by said transducer; and a dam assembly surrounding said probe to shield said probe from surface waves of the water in the pool, and from waves of less than a predetermined threshold, said dam assembly comprising a pair of elongated arcuate-shaped members spaced apart, and positioned in coaxial relationship with said tubular probe, and a pair of elongated arcuate-shaped shields mounted on said first-named arcuate-shaped members respectively to bridge the space between said first-named arcuate-shaped members in spaced relationship therewith.

4,533,908

WARNING MEANS FOR A SAFETY VALVE OF A HYDRAULIC POWER UNIT AND A HYDRAULIC POWER UNIT HAVING THE SAME

Masaki Fujikawa, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Dec. 9, 1981, Ser. No. 329,021
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—626 **2 Claims**

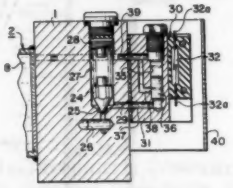
1. A warning means for a safety valve of a hydraulic power

unit, wherein said power unit is provided with a chamber having a safety valve in communication with a fluid relief path in further communication with an oil tank, said warning means comprising:

a valve body made of a nonmagnetic material and provided with a fluid conducting cylinder in communication with said relief path:

a magnet moveably positioned within said cylinder; and

a magnetically operated electric reed switch disposed adjacent to said cylinder and connected to a caution buzzer and a caution lamp, wherein the magnet is normally positioned away from the magnetically operated electric reed switch and is directly moved to a position adjacent the magnetically operated electric reed switch by an oil passed from said chamber through the safety valve and relief path and into said cylinder when the safety valve is opened by an overload in said chamber, thereby switching on the magnetically operated electric reed switch and operating the caution buzzer and caution light.



4,533,909

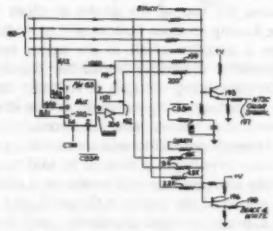
COMPUTER WITH COLOR DISPLAY

Wendell B. Sander, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 394,801, Jul. 2, 1982, abandoned, which is a division of Ser. No. 150,630, May 16, 1980, Pat. No. 4,383,296. This application Dec. 12, 1983, Ser. No. 560,529

Int. Cl.³ G09F *9/30*

U.S. Cl. 340—703 **11 Claims**



1. In a digitally controlled, raster scanned, video display for use with a microcomputer, or the like, which display provides color images in response to chroma signals having predetermined phase relationships to a reference signal of frequency (f), a circuit for providing a digitally controlled chroma signal comprising:

digital word generation means for generating predetermined digital signals;

serializing means coupled to said generation means for repeating said word in a serial form at a predetermined frequency so as to provide frequency components at said frequency f;

converting means, coupled to said serializing means for converting outputs from said serializing means to an AC signal;

whereby a video chroma signal is generated.

4,533,910

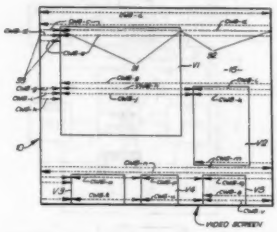
GRAPHICS DISPLAY SYSTEM WITH VIEWPORTS OF ARBITRARY LOCATION AND CONTENT

Josef Sukonick, Cupertino, and Bjorn M. Fjallstam, Sunnyvale, both of Calif., assignors to Cadtrak Corporation, Sunnyvale, Calif.

Filed Nov. 2, 1982, Ser. No. 438,476

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—721 **22 Claims**



1. A graphics display system of the type in which pixel data stored in a pixel memory is accessed and displayed on a video screen, said system facilitating the arbitary screen location and pixel content of one or more viewports, comprising:

control memory means for storing a control table comprising a set of control word sequences each consisting of one or more control words, each sequence specifying the portion of said stored pixel data which is to be displayed in a corresponding segment of a viewport associated with that sequence, and specifying other display parameters for said associated viewport,

first controller means for accessing from said pixel memory the pixel data portion specified by each control word sequence, and

second controller means for displaying said accessed pixel data portion in accordance with said display parameters specified by the associated control word sequence,

said first and second controller means operating repetitively in accordance with consecutive control word sequences to produce a complete screen display in which the viewport arrangement and content are defined by said sequences.

4,533,911

VIDEO DISPLAY SYSTEM FOR DISPLAYING SYMBOL-FRAGMENTS IN DIFFERENT ORIENTATIONS

Aryeh Finegold, Santa Clara, Calif., assignor to Daisy Systems Corporation, Mountain View, Calif.

Filed Feb. 24, 1982, Ser. No. 351,647

Int. Cl.³ G09G *1/16*

U.S. Cl. 340—727 **11 Claims**

1. In a raster scanned display, a system for providing symbols comprising:

memory means for storing a plurality of symbol-fragments, each of said symbol-fragments being represented in said memory means by a character block consisting of a predetermined number of lines and eacn of said lines including a predetermined number of bits;

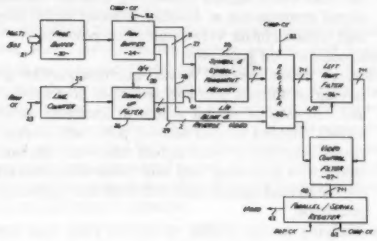
a page buffer for storing data representative of said symbol-fragments required for an entire frame of said display;

a row buffer coupled between said page buffer and memory means;

first circuit means coupled to the input of said memory means for selectively providing said lines for said symbol-fragments in a first order or in a reversed order and;

second circuit means coupled to the output of said memory means for selectively providing said bits for said lines in a

first order or in a reversed order after said lines are inputted to said memory means by said first circuit means;



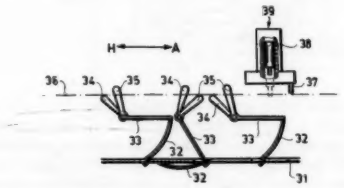
whereby said symbol-fragments may be used to form symbols for said display with different orientations.

4,533,912

EQUIPMENT FOR DISPLAYING ALPHANUMERICAL AND/OR PICTORIAL INFORMATION, PREFERABLY FOR USE ON A VEHICLE

József Gál; András Gyárfás; László Katkó ; Gábor Rácz; Ágoston Sarlós, and Gyula Vozári, all of Budapest, Hungary, assignors to Budapesti Muszaki Egyetem and Ikarus Karosszeria es Jarmugyar, both of Budapest, Hungary

Filed Feb. 28, 1983, Ser. No. 470,176
Int. Cl.³ G09G *3/34*
U.S. Cl. 340—783 **1 Claim**



1. An equipment for selectively displaying alphanumerical and/or pictorial information, preferably for use on vehicles, comprising:

a matrix-type display board including passive, two-state dots arranged in at least one column, the display board comprising a plate having a ground-color painted surface (11) wherein at least one aperture (12) is formed adjacent and parallel to each dot in said column of dots,

a plurality of tiltable masks (41, 51) arranged behind said apertures (12),

a plurality of tilting means, each for tilting a respective one of said masks through an associated one of said apertures (12) for covering in a tilted state one dot of the surface (11) of said plate, and for uncovering in a home state said one dot, the color of at least a portion of an outer surface of said masks being different from the said ground-color, each said tilting means comprising two levers (44, 45, 54, 55) mounted at different heights and angle positions and attached to the respective mask (41, 51), said first lever (44, 54), when in the tilted state of the mask (41, 51), extending beyond an actuating plane (36), and the second lever (45, 55), when in the home position of the mask (41, 51), extending beyond the said actuating plane (36) so that said levers (44, 45, 54, 55) at said states of the mask (41, 51), respectively, extend into the path of an actuating carriage (65) arranged behind said plate, said actuating carriage (65) being coupled with a drive, said path running along the plate parallel to said column, said actuating carriage (65) carrying actuating devices (39), one for each of said dots in said column, said actuating devices (39) being arranged along a line lying perpendicular to said column, each actuating device (39) including a fixed first pin (37) and a second actuating pin (38) having a rest and an actuated position, and,

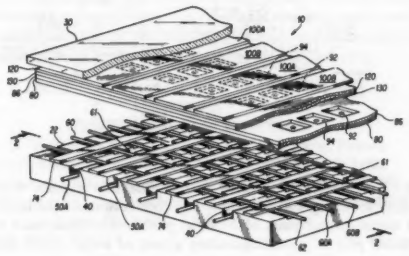
means coupling an electromechanical switch to said second actuating pins for selecting said actuated position to selectively operate said display.

4,533,913

GAS-FILLED DOT MATRIX DISPLAY PANEL AND OPERATING SYSTEM

Okan K. Tezucar, Scotch Plains, N.J., and David A. Parisi, Staten Island, N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 6, 1983, Ser. No. 482,590
Int. Cl.³ G09G *3/28*
U.S. Cl. 340—805 **10 Claims**



1. A display panel and system comprising

a matrix of first gas-filled cells arrayed in rows and columns,

an anode electrode and a cathode electrode associated with said first cells,

each of said cathode electrodes including a series of operating cathode portions, each portion being associated with one of said first cells,

circuit means coupled to said anode and cathode electrodes for turning on said first cells column by column in a scanning cycle, the turn-on of said cells generating cathode glow,

said circuit means also being operable to turn off each anode selectively to turn off the first cells associated therewith,

a matrix of display cells arrayed in rows and columns,

in each column of first cells and display cells there are two display cells associated with each first cell and each cathode portion,

a sustainer electrode disposed along each row of display cells,

a sustainer signal coupled to each sustainer electrode with the sustainer signals applied to adjacent sustainer electrodes including positive and negative pulses in series, with one sustainer signal being 180° out of phase with the other, and

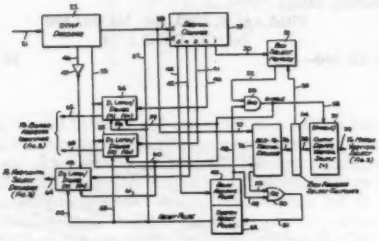
an electronic system for generating said sustainer signals, said system comprising first circuit means for simultaneously generating positive and negative pulses at the respective sustainer electrodes, second means for returning said sustainer signals and electrodes to a reference level after the termination of said positive and negative pulses, third means for generating negative and positive pulses at the respective sustainer electrodes, and control means for operating said first, second and third means in repetitive sequences, with the second means being operated after the first means is operated and after the third means is operated to produce two simultaneous sustainer signals, one of which includes a positive pulse, a reference level, a negative pulse, and a reference level, and the other

signal includes a negative pulse, a reference level, a positive pulse, and a reference level.

4,533,914
REMOTELY CONTROLLED CROSSCONNECTION SYSTEM

Thomas B. Norling, Piscataway; Joseph H. Polkowski, Lakewood; Jeffrey A. Poulsen, Fords, and Daniel E. Robinson, Metuchen, all of N.J., assignors to GK Technologies, Incorporated, Greenwich, Conn.

Filed Nov. 8, 1982, Ser. No. 440,247
Int. Cl.³ H04Q 3/26; H04M 3/00
U.S. Cl. 340—825.79 **15 Claims**



1. A remotely controlled crossconnection system for remotely selecting and switching the connections of the individual signal circuit pairs of a plural pair feeder cable each to a selected pair of a corresponding group of local circuit pairs, each group of local circuit pairs having only one pair in use at a time and connected through said crossconnection system to said feeder cable, said system comprising in combination, for installation in a crossconnection box at the field termination of a feeder cable, a switching matrix having a plurality of selectable switching means each with a feeder cable pair connection point and means for selectably connecting said connection point to a plurality of selectable local pair connection points arranged for connection to the pairs of a corresponding one of said groups of local circuit pairs, a decoder device, means coupled between said decoder device and one axis of said matrix for storing information corresponding to one digit of a plural digit encoded signal upon receipt of said one digit in a predetermined digit sequence, means for applying a control to another axis of said matrix upon receipt of a signal corresponding to a subsequent digit of said plural digit encoded signal, said last mentioned means including means for simultaneously using said stored information to apply a corresponding control to said one axis, the application of said controls to said axes serving to select and operate one of said switching means, means for coupling an input of said decoder device to a spare one of said feeder cable signal circuit pairs, and a power supply for supplying operating power to said decoder device and said matrix control means, said power supply having a power input terminal, and means for connecting said power input terminal to said spare one of said feeder cable signal circuit pairs in a phantom circuit for receiving energizing power over said feeder cable.

4,533,915
RADAR TERRAIN SIGNAL SUPPRESSOR

George A. Lucchi, Granada Hills, and Jalal Alisobhani, Northridge, both of Calif., assignors to Sperry Corporation, New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,121
Int. Cl.³ G01S 13/95, 7/28
U.S. Cl. 343—5 W **6 Claims**

1. In a pulsed weather radar system including a pulse transmitter and a receiver wherein radar echo pulses are detected to provide video signals, the improvement comprising:

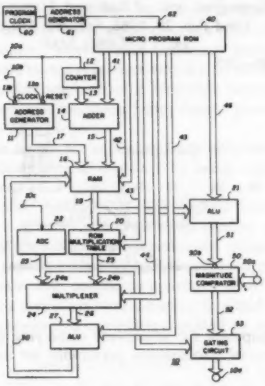
input means for providing digital signals representative of video signals derived by detecting radar echoes received in response to pulses transmitted from said pulse transmitter, said video signals containing weather induced video signal components at weather induced signal frequencies and terrain clutter video signal components;

microinstruction generator;

memory means coupled to said microinstruction generator having an address port and an output port for the storage and retrieval of digital words in locations indicated by signals coupled to said address port, said storage occurring in response to write signals received from said microinstruction generator and said retrieval occurring in response to read signals received from said microinstruction generator;

multiplying means having an output port, and input port coupled to said memory means output port, and further having an instruction port coupled to said microinstruction generator, for the multiplication of signals applied to said multiplication means input port by the constants C and D as selected by said microinstruction generator, and coupling said multiplied signal to said output port thereof;

multiplexing means having first and second input ports, an output port, and an instruction terminal, said first input port being coupled to said signal input means, said second input port being coupled to said multiplication means, and said instruction terminal being coupled to said microinstruction generator, for switchably coupling signals received from said first input port and said second input port to said mulitplexer output port responsive to signals received from said microinstruction generator;



first arithmetic logic unit means having an input port coupled to said multiplexer means output port, an output port coupled to said memory means addressing port, and an instruction port coupled to said microinstruction generator, for adding, subtracting and transferring signals applied to said input port in accordance with instruction signals received at said instruction port and for providing added, subtracted and transferred signals at said output port;

second arithmetic logic unit means having an instruction port coupled to said microinstruction generator means, an input port coupled to said memory means output port, and an output port, for adding, subtracting and transferring signals applied to said second arithmetic logic unit means input port in accordance with instruction signals received at said instruction port for stopping digital signals representative of said terrain clutter video signal components and providing digital signals representative of said weather induced video signal components at said output port;

comparator means coupled to said output port of said second

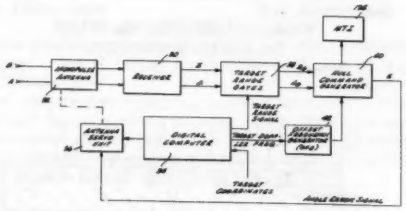
arithmetic logic unit for comparing said digital signals representative of said weather induced video signal components with a digital threshold signal to provide relative level representative signals; and

gate means coupled to said comparator means to receive said relative level representative signals and to said input means to receive said digital signals representative of said video signals for coupling said representative digital signals to an output terminal when said relative level representative signal indicates that said digital signals representative of said weather induced video signal components exceed said digital threshold signal, thereby coupling said video signals representative digital signals from said input means to said output terminal.

4,533,916
MONOPULSED RADAR SYSTEM FOR TRACKING GROUND TARGETS

Frederick C. Williams, Topanga, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 30, 1968, Ser. No. 756,691
Int. Cl.³ G01S *13/68*
U.S. Cl. 343—7.4 **15 Claims**



1. A monopulse radar receiving system comprising:

receiving means including an antenna, and a receiver for providing sum and difference signals respectively having the characteristic sum pattern maximum and difference pattern null amplitudes on a common azimuth and representing energy reflected from a stationary target area under radar surveillance;

means for providing a target doppler frequency signal representing the azimuth of said target area; and

error signal generating means responsive to said sum, difference and target doppler frequency signals for producing error signals representative of the direction and magnitude of the positional difference between the difference pattern null azimuth and the target area azimuth, said error signal generating means including means for compensating for antenna pointing errors produced by signals reflected from moving objects in the target area.

4,533,917
MULTIPLE FREQUENCY SIDE LOBE INTERFERENCE REJECTOR

John C. Reed, 439 Nevin St., Lancaster, Pa. 17603

Filed Mar. 26, 1984, Ser. No. 593,151
Int. Cl.³ G01S *3/16, 3/28*
U.S. Cl. 343—379 **12 Claims**

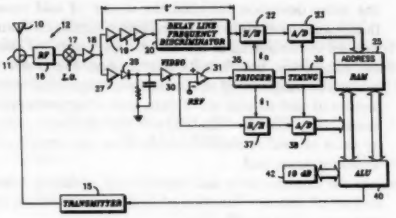
1. A multiple frequency side-lobe interference rejector comprising:

a receiver for receiving transmitted signals within a predetermined band of frequencies and providing output signals representative thereof;

first means coupled to said receiver for receiving the output signals therefrom and providing signals representative of the frequency thereof;

second means coupled to said receiver for receiving the output signals therefrom and providing signals representative of the amplitude thereof;

memory means having a plurality of storage areas, one for each of a plurality of bins of frequencies in the band, and a storage area selection input; and

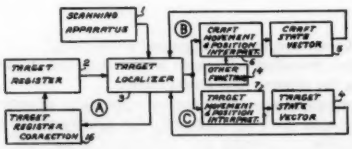


means connecting the signals provided by said first means to the storage area selection input of said memory means and connecting the signals provided by said second means to said memory means for storage in the selected area.

4,533,918
PILOT ASSISTANCE DEVICE

Alain D. Virnot, 21 Rue des Canettes, 75006 Paris, France

Continuation-in-part of Ser. No. 127,060, Mar. 4, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 338,456
Claims priority, application France, Mar. 8, 1979, 79 05989
Int. Cl.³ G01S *1/68;* G01F *15/50*
U.S. Cl. 343—451 **18 Claims**



1. A device, for pinpointing the position of a mobile locus within an area in relation to the location of at least one known sendentary locus, in response to signals generated by a radar apparatus associated with said mobile locus and surveying said area, when said radar apparatus is targeted on a topological feature characterizing said sendentary locus, comprising:

means for storing in machine-readable form a first set of data relative to the location characteristics of the sendentary locus;

means for holding a second set of data having variable factors relative to the state vector of the mobile locus;

means for defining the expected relative location of the targeted locus as a function of said first and second sets of data;

means for acquiring a view of said expected relative location, said means for acquiring including means for calculating the radar scanning time limits of an observation window outlining a scanning zone centered on said expected location, said observation window being narrowly circumscribed about the targeted locus; for selectively accepting reflecting signals from the radar apparatus corresponding to topological features within said scanning zone, said means being adjusted to eliminate reflecting signals from objects other than the targeted locus; for generating from said reflecting signals an array of marks and for placing said marks in said array in a topological arrangement representing the respective origins of said reflecting signals within said scanning zone;

means for enhancing said arrangement by eliminating spurious marks from said array;

means for estimating the difference between the expected relative location of the targeted locus and the location corresponding to the position of the marks in said array, said means for estimating including means for determining the mean deviation between the center of said zone and the locations of origin of the reflective signals indicated by the marks remaining in the array, and means for computing correction coefficients based upon the observation partials corresponding to the rate of change of the variable factors of said second set of data, said observation partials being computed as a functions of the deviation indicated by each of said remaining marks from the center of said scanning zone; and

means for continuously and repetitively updating said second set of data as a function of said mean deviation and of said correction coefficients.

4,533,919

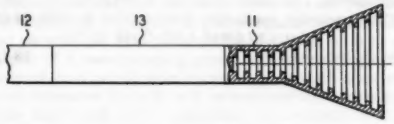
CORRUGATED ANTENNA FEED ARRANGEMENT

Corrado Dragone, Little Silver, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 14, 1983, Ser. No. 542,137

Int. Cl.³ H01Q *13/02*

U.S. Cl. 343—786 **5 Claims**



1. An antenna feed arrangement comprising:

a smooth-walled waveguide section disposed at an entrance to the antenna feed arrangement;

a corrugated waveguide section disposed at an output of the antenna feed arrangement, the corrugated waveguide section comprising corrugations of a uniform predetermined depth and gap therebetween to provide a minimum reflection at a first frequency of interest; and

a quarter-wave transformer section disposed between the smooth-walled waveguide section and the corrugated waveguide section, the transformer section comprising a plurality of N corrugated waveguide subsections, where $N \geq 2$, including corrugation depths which correspond to the corrugation depths of the corrugated waveguide section, each of the N corrugated waveguide subsections of the transformer section including gaps between corrugations which are the same for each section but which differ in size by predetermined amounts in adjacent subsections in a direction way from the smooth-walled waveguide section for generating a maximally flat response at a second frequency of interest which is separated from said first frequency of interest.

4,533,920

INK-JET RECORDING METHOD

Eiichi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

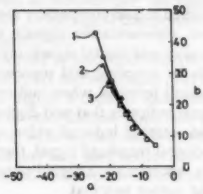
Filed May 29, 1984, Ser. No. 614,771

Int. Cl.³ G01D *15/18*; C09D *11/00*

U.S. Cl. 346—1.1 **5 Claims**

1. A method for ink jet recording which comprises using inks of one or more colors and a plurality of inks different in dye concentration being used for each color, characterized in that the pH of the inks for each color satisfies the following relation,

$$0.85 \leqq \text{pH min/pH max}$$



where pH min is the minimum value of pH of the inks for each color and pH max is the maximum value of pH of the inks for said color.

4,533,921

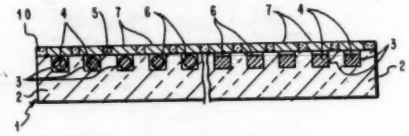
ELECTROEROSION PRINTHEAD WITH TUNGSTEN ELECTRODES, AND A METHOD FOR MAKING SAME

Willie Goff, Jr., Austin, and James M. Rakes, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,703

Int. Cl.³ G01D *9/00, 15/16*

U.S. Cl. 346—1.1 **10 Claims**



1. An electroerosion printhead having at least one row of equally spaced tungsten wire electrodes fixed in a carrying substrate

characterized in that

a. each of said electrodes (4) in a contact area (8) spaced from the print tip (9) has its periphery completely covered with a copper layer (6),

b. each of said covering layers is electrically isolated from the layers of adjacent electrodes, and

c. each of said covering layers lies in a common surface (5) with other covering layers and forms a connector surface that extends essentially parallel to the longitudinal axis of said electrode.

4,533,922

LINEARLY PARALLEL MULTIPEN RECORDER

Hideto Tanaka, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 27, 1984, Ser. No. 605,161

Claims priority, application Japan, Apr. 27, 1983, 58-74757; Apr. 27, 1983, 58-74758

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—1.1 **14 Claims**

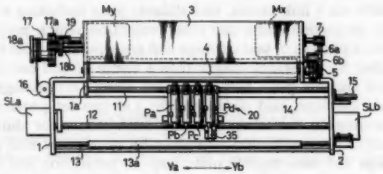
10. A method of setting the initial position of a pen recorder having: two bases adapted to be movable in directions along a platen, one of said bases being pulled by a pulse motor; a plurality of pens mounted on one of said bases; a hammer mounted on the other base for pressing any one of said pens toward said platen; and a lock mechanism for connecting said bases while changing the relative position between said bases, said method comprising the steps of:

starting said pulse motor under the state where said bases are

connected through said lock mechanism, to move one of said bases to its dead point;

making said pulse motor step out after said dead point is reached;

canceling the locking to separate said bases from each other;



moving the other base to its dead point; and

making said pulse motor step out again after said the other base reaches its dead point, thereby to set the initial positions of both said bases.

4,533,923

INK-JET RECORDING METHOD

Eiichi Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1984, Ser. No. 612,701
Claims priority, application Japan, May 24, 1983, 58-89932
Int. Cl.³ G01D *15/18*; C09D *11/02*
U.S. Cl. 346—1.1 **3 Claims**

1. An ink-jet recording method in which inks of one or more colors and for each color a plurality of inks of different dye concentrations are employed, characterized in that maximum value (Vmax) of the viscosities of the inks of each color and the minimum value (Vmin) thereof satisfy the relation

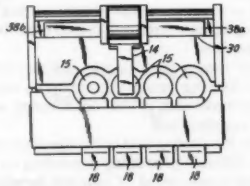
$$0.8 \leqq Vmin/Vmax.$$

4,533,924

MECHANISM FOR SELECTING PEN IN AN X-Y PLOTTER

Shunetsu Ta'cahashi, Shiojiri, Japan, assignor to Epson Corporation, Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,139
Claims priority, application Japan, Sep. 9, 1982, 57-156934
Int. Cl.³ G01D *9/28, 15/16*
U.S. Cl. 346—49 **8 Claims**



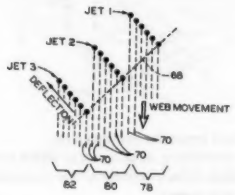
1. A pen selection mechanism for selecting a desired pen in an X-Y plotter which plots on a paper comprising first and second opposed side frames, a shaft supported intermediate said first and second side frames which extends essentially perpendicular thereto, a carriage supported on said shaft and guided thereby, said carriage including a plurality of recording pens arranged in a line along the axial direction of said shaft, said carriage moving essentially perpendicular to said paper, a hammer axially movable along said shaft in response to movement of said carriage, and changing means for moving said hammer in a direction opposite to movement of said carriage during and in response to a single movement of said carriage towards one of said first and second side frames for positioning said hammer with respect to a selected one of said plurality of recording pens so that said hammer can select said selected recording pen upon said single movement of said carriage to plot on said paper.

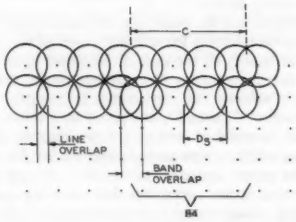
4,533,925

INK JET PRINTER WITH NON-UNIFORM RECTANGULAR PATTERN OF PRINT POSITIONS

Sherman H. Tsao, Plano, and Kenneth T. Zeiler, Richardson, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 22, 1984, Ser. No. 623,693
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **10 Claims**





1. An ink jet printer for printing a print image on a moving print medium by selectively depositing ink drops at a plurality of print positions arranged in a rectangular grid on the medium such that a plurality of print lines are formed on said medium, comprising:

means for generating a plurality of jet drop streams directed toward the print medium, said streams arranged in a jet row which is skewed with respect to the direction of movement of the moving print medium,

means for selectively deflecting drops from each jet drop stream perpendicular to said jet row to a plurality of print positions in an associated band of print positions, thereby printing along a band of print lines, with drops deposited along adjacent print lines by adjacent jets overlapping more than drops deposited along adjacent print lines by the same jet, said rectangular grid arranged such that:

$$S_H/S_V = K(n \pm 1/M)(S_V/C), \text{ and } S_V \neq S_H,$$

where

S_H = horizontal displacement between adjacent print positions in a band;

S_V = vertical displacement between adjacent print positions in a print line;

M = number of print positions serviced by each jet drop stream;

n = number of rows of print positions between print positions successively serviced by each jet, plus 1;

K = vertical displacement between adjacent jet drop streams divided by S_V; and

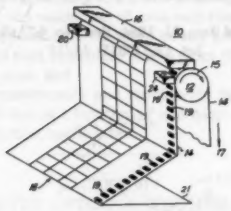
C = horizontal displacement between adjacent jet drop streams.

4,533,926

STRIP CHART RECORDER AND MEDIUM STATUS

Tibor L. Foldvari, Cheshire; Donald R. Boucher, Meriden, both of Conn., and Eugene L. Flanagan, III, Manhasset, N.Y., assignors to American Home Products Corporation (Del.), New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,538
Int. Cl.³ G01D 15/24; B65H 25/24; G03B 27/52
U.S. Cl. 346—136 6 Claims



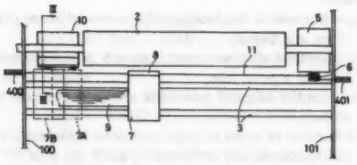
1. A strip chart recorder comprising:
a device for recording data on strip chart paper, said paper having indicia which represent the proximity of an end of the strip chart paper;
advancing means for advancing the strip chart paper past the recording device;
detecting means for detecting the indicia; and
alert means operable for alerting a user of the recorder as to the proximity of the end of the paper upon detection by the detecting means of a predetermined number of said indicia wherein the alert means is operative to signal the proximity of the end of the paper only when the predetermined number of indicia are detected by the detecting means within a time period required for the advancement of the paper a predetermined distance; and wherein the detecting means comprises first counting means for producing a count signal representative of the number of said indicia detected; generating means for generating a periodic signal having a frequency proportional to the speed of advancement of the paper through the recorder; and second counting means for producing a predetermined count signal indicative of the repetition of said periodic signal a predetermined number of times; the first counting means being operative to reset upon the production of the predetermined count signal.

4,533,927

CAPPING MECHANISM FOR PREVENTING NOZZLE BLOCKING IN AN INK JET SYSTEM PRINTER

Fusao Iwagami, Nara, and Hisashi Yoshimura, Soraku, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 5, 1983, Ser. No. 491,666
Claims priority, application Japan, May 6, 1982, 57-76143; May 6, 1982, 57-76144
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 3 Claims



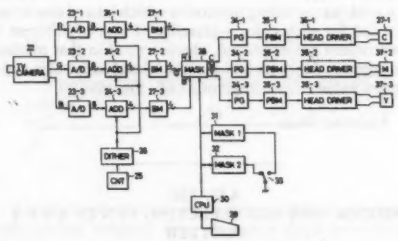
1. A nozzle capping mechanism in an ink jet system printer containing a printer head mounted on a carriage for covering nozzle slits in said printer head when said carriage is located in a stand-by position when said printer is placed in a non-operating condition comprising:
a cap member for capping said printer head, and
a slidable plate means for supporting said cap member, said slidable plate being rotatably mounted on a stationary table via a link means, said slidable plate including a cap set projection and a cap reset projection which projects into a passage of said carriage and are separated from each other by a distance longer than a width of said carriage; said slidable plate being disposed along said passage of said carriage, said slidable plate and cap set projection forming, in combination, a cap drive means for shifting said cap member into said stand-by position of said carriage and said slidable plate, cap set projection and link means forming, in combination, a cap shifting means which pushes said cap member toward said printer head when said carriage is placed in said stand-by position.

4,533,928

COLOR IMAGE PROCESSING APPARATUS

Susumu Sugiura, Yamato, and Yasuo Kohzato, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,900
Claims priority, application Japan, Apr. 30, 1982, 57-71372; May 6, 1982, 57-74560
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 11 Claims



1. Color image forming apparatus for forming a color image on a recording member, comprising:
dot forming means for forming colored dots in at least three colors during reciprocating relative movement of said dot forming means and the recording member in more than one direction;
color signal processing means for converting input signals representing at least three colors into recording signals for forming the dots;
timing control means for changing the recording sequence of said dot forming means depending on the direction of the relative movement of said dot forming means and the recording member; and
control means for causing said color signal processing means to provide different processing depending on the direction of the relative movement of said dot forming means and the recording member.

4,533,929

HEAT-SENSITIVE RECORDING SHEET

Kensuke Ikeda, and Sukenori Nakamura, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 21, 1983, Ser. No. 554,147
Claims priority, application Japan, Nov. 22, 1982, 57-205270
Int. Cl.³ B41M 5/18
U.S. Cl. 346—209 14 Claims

1. A heat-sensitive recording sheet, comprising:
a support base having thereon;

a colorless or light-colored electron donating dye;
an electron-accepting compound which reacts with the dye to form a color; and
di-2-ethylhexyl sulfosuccinate as a surface active agent.

4,533,930

RECORDING MATERIALS

Shunshuke Shioi, Daito; Yasuo Takekawa, Neyagawa, and Makoto Miyake, Ashiya, all of Japan, assignors to Kanzaki Paper Manufacturing Company, Ltd., Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,811
Claims priority, application Japan, Aug. 31, 1981, 56-137291
Int. Cl.³ B41M 5/18, 5/22
U.S. Cl. 346—211 4 Claims

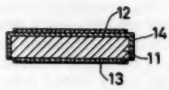
1. In recording materials which comprise
a support
a metal compound, and
a ligand compound,
at least one of said compounds being provided on said support, said metal compound and said ligand compound being physically separated from one another and capable of forming a colored complex by chemical reaction between the metal compound and the ligand compound upon admixture thereof, the improvement wherein said metal compound comprises an organic phosphorous-iron compound having a bond of PO^- and/or PS^- with Fe^{+++} in the molecule and said ligand compound is capable of reacting with the organic phosphorous-iron compound to form a complex.

4,533,931

REDUCTION REOXIDATION TYPE SEMICONDUCTOR CERAMIC CONDENSER

Harufumi Mandai, Osaka; Kiyoshi Iwai, and Yasuyuki Naito, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Feb. 6, 1984, Ser. No. 577,020
Claims priority, application Japan, Feb. 7, 1983, 58-19459
Int. Cl.³ H01L 29/12; H01G 9/00
U.S. Cl. 357—10 10 Claims



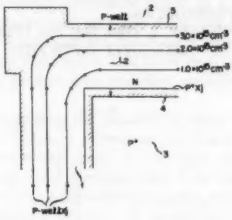
1. A reduction reoxidation type ceramic semiconductor condenser comprising:
a semiconductor ceramic portion, a layer of a first material on a surface of said ceramic portion forming an ohmic electrode thereon, a dielectric layer on another surface of said ceramic portion, said dielectric layer being formed by reoxidation of said ceramic, a layer of a second material on a surface of said dielectric layer, said second material forming a non-ohmic electrode thereon, said ohmic layer being comprised of electrode forming material capable of forming said ohmic electrode during reoxidation of said ceramic portion while preventing significant oxidation of said ceramic portion in contact with said electrode forming material.

4,533,932

SEMICONDUCTOR DEVICE WITH ENLARGED CORNERS TO PROVIDE ENHANCED PUNCH THROUGH PROTECTION

Takeo Kondo, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 131,425, Mar. 18, 1980, abandoned.
This application Dec. 20, 1982, Ser. No. 451,412
Claims priority, application Japan, Mar. 22, 1979, 54-32254; Nov. 10, 1979, 54-145733; Nov. 10, 1979, 54-145738
Int. Cl.³ H01L 29/90
U.S. Cl. 357—13 3 Claims



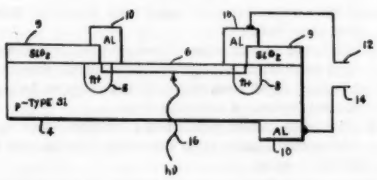
1. A semiconductor device comprising:
a substrate of a first conductivity type;
a first semiconductor area formed in said semiconductor substrate and having a second conductivity type opposite to said first conductivity type, said first area including a first corner; and
a second semiconductor area of said first conductivity type formed in said first area, said second area having a second corner aligned with said first corner and formed such that the distance between said substrate and said second area, measured laterally with respect to the surface of said substrate, is at a maximum at said first and second corners in order to prevent a punch-through at said first and second corners.

4,533,933

SCHOTTKY BARRIER INFRARED DETECTOR AND PROCESS

Paul W. Pellegrini, Bedford; Charlotte E. Ludington, Sherborn; Aleksandar Golubovic, Brookline, and Melanie M. Weeks, Fitchburg, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 7, 1982, Ser. No. 447,599
Int. Cl.³ H01L 29/48
U.S. Cl. 357—15 5 Claims



1. A Schottky barrier infrared photovoltaic detector wherein the operation of said detector in the infrared portion of the electromagnetic spectrum is by internal photoemission of holes over an electrical barrier, said detector comprising:
a silicon substrate having a first and an opposed second surface;

a layer of iridium silicide formed on said first surface of said substrate; and

first and second contact means for making ohmic contact with said layer of iridium silicide and with said silicon substrate respectively;

said silicon substrate comprising a wafer of p-type silicon material having an impurity concentration level not exceeding $10^{16}/cm^3$.

4,533,934

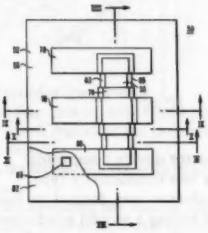
DEVICE STRUCTURES FOR HIGH DENSITY INTEGRATED CIRCUITS

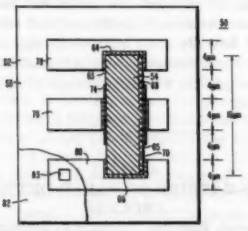
Philip C. Smith, Columbia, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1980, Ser. No. 192,961

Int. Cl.³ H01L *27/12, 29/78;* G11C *11/40*

U.S. Cl. 357—23.7 **48 Claims**





1. A semiconductor device comprising:

an insulating substrate,

a semiconductor layer having an upper and lower surface positioned on said insulating substrate and having a predetermined thickness,

first and second spaced-apart edges formed by sidewall surfaces extending between said upper and lower surface of said semiconductor layer,

said semiconductor layer doped with impurities to exhibit a first type material,

said first and second edges doped with impurities of a second type introduced through said sidewall surfaces to a predetermined depth from said respective edge to form first and second regions of a second type,

a layer of insulation positioned over said upper surface of said semiconductor layer extending between said first and second regions,

a layer of conductive material positioned over said insulation layer and extending between said first and second regions,

first means for making ohmic contact to said first region including aluminum deposited on said first region and extending over onto said upper surface of said semiconductor layer, and

second means for making ohmic contact to said second region.

4,533,935

SEMICONDUCTOR DEVICE AND A METHOD FOR MANUFACTURING THE SAME

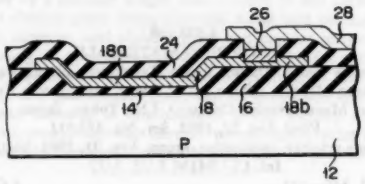
Toru Mochizuki, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 4, 1981, Ser. No. 289,995

Claims priority, application Japan, Sep. 4, 1980, 55-122651

Int. Cl.³ H01L *27/02, 29/34, 23/48*

U.S. Cl. 357—51 **2 Claims**



1. A semiconductor device which comprises:

a first conductive layer formed of refractory metal silicide overlying a semiconductor substrate;

an insulation layer formed on the first conductive layer;

a second conductive layer formed on the insulation layer; and

a resistor formed of an oxide or nitride of the refractory metal silicide which connects together the first and second conductive layers, that portion of said resistor which exerts resistance being formed in an opening selectively formed in the insulation layer.

4,533,936

SYSTEM FOR ENCODING AND DECODING VIDEO SIGNALS

Jerome J. Tiemann, Schenectady, and William E. Engeler, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 28, 1983, Ser. No. 479,584

Int. Cl.³ H04N *9/32*

U.S. Cl. 358—12 **18 Claims**

1. A system for multiplexing a first video signal and a second video signal into a compound video signal having a bandwidth substantially less than the sum of the bandwidths of the first and second video signals comprising.

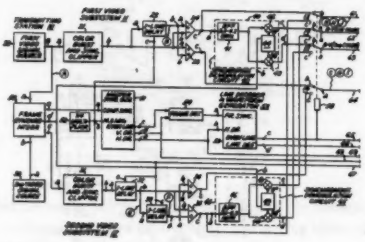
means for providing said first video signal, said first video signal including a plurality of successive lines of signal, each line having a duration of a first predetermined time, said plurality of lines consisting of a first set of alternate lines and a second set of alternate lines,

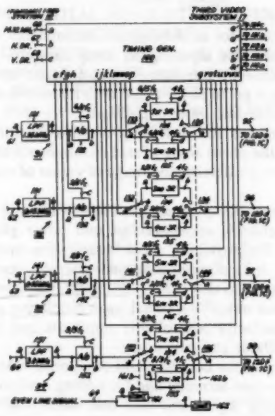
each line of said first video signal including a first luminance component having frequencies extending over a band of frequencies from zero frequency to a first predetermined frequency, a first color component consisting of sidebands of a subcarrier of one phase modulated in amplitude by a first color signal, and a second color component consisting of side bands of said subcarrier of another phase modulated in amplitude by a second color signal, said other phase being in quadrature to said one phase, said subcarrier having a frequency which is situated near the upper end of said band of frequencies of said first luminance component and which is an odd multiple of one-half of the reciprocal of said first predetermined time,

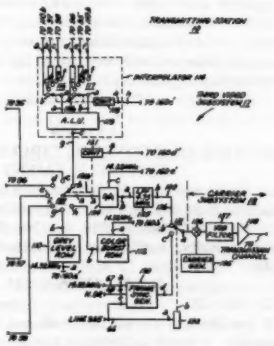
means for forming a plurality of lines of a first combined luminance signal, said plurality of lines of said first combined luminance signal consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, the amplitude of each line of said first set of alternate lines of said first combined luminance signal being a first linear combination of the amplitudes of lines of said first set of alternate lines of said first luminance signal and the amplitudes of lines of said second set of alternate lines of said first lumi-

nance signal, the amplitude of each line of said second set of alternate lines of said first combined luminance signal being zero,

means for forming a plurality of lines of a second combined luminance signal, said plurality of lines of said second combined luminance signal consisting of lines of a first set







of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, the amplitude of each line of said first set of alternate lines of said second combined luminance signal being a second linear combination of the amplitudes of lines of said first set of alternate lines of said first luminance signal and the amplitudes of lines of said second set of alternate lines of said first luminance signal, said second linear combination of said first luminance signal being independent of said first linear combination of said first luminance signal, the amplitude of each line of said second set of alternate lines of said second combined luminance signal being zero,

means for limiting the bandwidth of said first combined luminance signal to a first predetermined bandwidth,

means for limiting the bandwidth of said second combined luminance signal to a second predetermined bandwidth, said second predetermined bandwidth being substantially less than said first predetermined bandwidth,

means for compressing the duration of each of the lines of said first combined luminance signal to a duration of a second predetermined time less than said first predetermined time to increase the bandwidth thereof to a third predetermined bandwidth, said third predetermined bandwidth being greater than said first predetermined bandwidth,

means for compressing the duration of each of the lines of said second combined luminance signal to a duration of a third predetermined time to increase the bandwidth thereof to said third predetermined bandwidth,

means for providing a second video signal, said second video signal including a plurality of successive lines of signal each line having a duration of said first predetermined time, said plurality of lines consisting of a first set of alternate lines and a second set of alternate lines,

each line of said second video signal including a second luminance component having frequencies extending over a band of frequencies from zero frequency to said first predetermined frequency, a third color component consisting of sidebands of a subcarrier of one phase modulated in amplitude by a third color signal, and a fourth color component consisting of sidebands of said subcarrier of another phase modulated in amplitude by a fourth color signal, said other phase being in quadrature to said one phase, said subcarrier having a frequency which is situated near the upper end of said band of frequencies of said second luminance component and which is an odd multiple of one-half of the reciprocal of said first predetermined time,

means for forming a plurality of lines of a third combined luminance signal, said plurality of lines of said third combined luminance signal consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, the amplitude of each line of said first set of alternate lines of said third combined luminance signal being a third linear combination of the amplitudes of lines of said first set of alternate lines of said second luminance signal and the amplitudes of lines of said second set of alternate lines of said second luminance signal, the amplitude of each line of said second set of alternate lines of said third combined luminance signal being zero,

means for forming a plurality of lines of a fourth combined luminance signal, said plurality of lines of said fourth combined luminance signal consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, the amplitude of each line of said first set of alternate lines of said fourth combined luminance signal being a fourth linear combination of the amplitudes of lines of said first set of alternate lines of said second luminance signal and the ampliutdes of lines of said second set of alternate lines of said second luminance signal, said fourth linear combination of said second luminance signal being independent of said third linear combination of said second luminance signal, the amplitude of each line of said second set of alternate lines of said fourth combined luminance signal being zero,

means for limiting the bandwidth of said third combined luminance signal to said first predetermined bandwidth,

means for limiting the bandwidth of said fourth combined luminance signal to said second predetermined bandwidth,

means for compressing the duration of each of the lines of said third combined luminance signal to a duration of said second predetermined time to increase the bandwidth thereof to said third predetermined bandwidth,

means for compressing the duration of each of the lines of said fourth combined luminance signal to a duration of said third predetermined time to increase the bandwidth thereof to said third predetermined bandwidth,

means for forming a plurality of lines of a first compound video signal, said plurality of lines of said first compound video signal consisting of a first set of alternate lines and a second set of alternate lines, each line of said first set of alternate lines of said first compound video signal being formed by time multiplexing a respective compressed line of said first combined luminance signal and a respective compressed line of said second combined luminance signal, the amplitude of each line of said second set of alternate lines of said first compound video signal being zero,

means for forming a plurality of lines of a seocnd compound video signal, said plurality of lines of said second compound video signal consisting of lines of a first set of alternate lines and a second set of alternate lines, each line of said first set of alternate lines of said second compound video signal being formed by time multiplexing a respective compressed line of said third combined luminance signal and a respective compressed line of said fourth combined luminance signal, the amplitude of each line of said second set of alternate lines of said second compound video signal being zero,

means for interleaving the lines of said first set of alternate lines of said first compound video signal and said first set of lines of said second compound video signal to provide a third compound video signal.

4,533,937

KEY SIGNAL GENERATING APPARATUS FOR DIGITAL CHROMAKEY SYSTEM

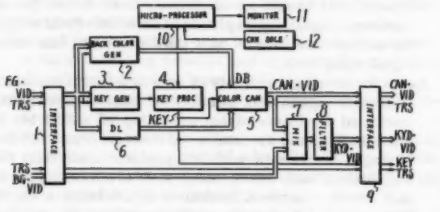
Kaichi Yamamoto, Zama, and Jun Yonemitsu, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,329

Claims priority, application Japan, Sep. 12, 1981, 56-144535

Int. Cl.³ H04N 9/535

U.S. Cl. 358—22 **14 Claims**



1. A chromakey system for mixing a first video signal with a second video signal in accordance with a key signal; said system comprising:

means for determining the difference between a reference hue data sample and a hue data sample of said first video signal in U-V chroma signal coordinates; and

means for generating said key signal having a magnitude which is determined according to a predetermined quadratic curve relationship based upon said difference.

4,533,938

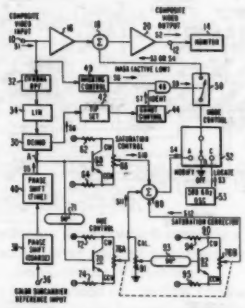
COLOR MODIFIER FOR COMPOSITE VIDEO SIGNALS

Robert N. Hurst, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 20, 1982, Ser. No. 451,432

Int. Cl.³ H04N 9/535

U.S. Cl. 358—27 **15 Claims**



1. Apparatus for modifying the chrominance component of a composite video input signal, comprising:

first means for providing a color phase reference signal having a given phase angle with respect to the burst component of said video input signal;

second means for providing a color identification signal when the phase angle of said chrominance component lies within a predetermined range of values of said given phase angle;

third means comprising a first amplitude and polarity control network responsive to said color phase reference signal for providing a color saturation modifying signal and a second amplitude and polarity control network responsive to said color phase reference signal for providing a hue modifying signal, each modifying signal being of independently controllable amplitude and independently controllable polarity; and

fourth means for coupling said composite video input signal to an output terminal and for adding said color saturation modifying signal and said hue modifying signal to the coupled signal when said color identification signal is present to provide a modified composite video output signal at said output terminal in which the saturation and the hue of selected colors represented by the chrominance component of said modified composite video output signal may be independently controlled by said first and second networks, respectively.

4,533,939

INTEGRABLE HUE CONTROL CIRCUIT HAVING A D.C. SETTING ELEMENT

Adriaan Cense, and Evert H. Schutte, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 585,968

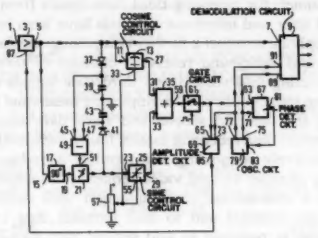
Claims priority, application Netherlands, Mar. 22, 1983, 8301014

Int. Cl.³ H04N 9/535

U.S. Cl. 358—28 **3 Claims**

1. A hue control circuit comprising a setting element for substantially, without influencing the amplitude, shifting the phase of a color synchronizing signal and a color television chrominance signal to be demodulated with respect to each other, characterized in that an input of the hue control circuit is coupled to an adder circuit via a first control circuit and via a circuit which shifts the phase substantially through 90° and a second control circuit, the first and second control circuits being adjustable by means of a d.c. voltage which can be

varied by the setting element, the first control circuit having a substantially cosinusoidal influence and the second control circuit a substantially sinusoidal influence on the amplitude of



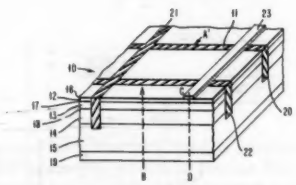
the signal conveyed through it as a function of the deviation of the d.c. voltage from that produced by the setting element in a normal position of this setting element.

4,533,940

HIGH SPATIAL RESOLUTION ENERGY DISCRIMINATOR

Barbara A. Chappell; Terry I. Chappell, both of RFD Adele Court, Amawalk, N.Y. 10501, and Jerry M. Woodall, 336 Cherry St., Bedford Hills, N.Y. 10507

Filed Jun. 13, 1983, Ser. No. 503,945
Int. Cl.³ H04N *9/04*
U.S. Cl. 358—44 **12 Claims**



1. An energy discriminator of the type wherein a beam of energy is received through a receiving surface of a multi-parallel layer, monocrystalline semiconductor body, each layer thereof being responsive to a particular energy component of said beam by forming hole electron pair carriers therein, the improvement comprising means for producing in said monocrystalline semiconductor body an electron retaining potential well associated with each layer of said body, said means having an asymmetric barrier to electron flow, and readout means transferring the charge from said retained electrons into an output signal.

4,533,941

METHOD AND APPARATUS FOR HALF-TONE REPRODUCTION OF A VARYING TONE ORIGINAL IMAGE

John F. Keane, Bellbrook; John C. Butler, and Timothy H. Archer, both of Centerville, all of Ohio, assignors to Coulter Systems Corporation, Bedford, Mass.

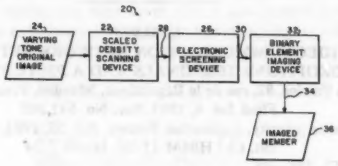
Filed Jan. 14, 1983, Ser. No. 458,167
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **33 Claims**

1. A method of producing a half-tone reproduction of a varying tone original image, comprising:

A. providing scaled density information data representing the varying tone of the original image with each datum representing the scaled density of the tone in a scanned incremental area of the original image and including simultaneously presenting said data from a plurality of rows;

B. digitally comparing each presented sealed density information datum from each scan row with a plurality of screen matrix information data that include desired half-tone screen frequency and angle information to produce therefrom a plurality of binary element information data that include both scaled density information and screen frequency and angle information;

C. imaging a member to form thereon sequential binary elements along finite lines on said member in accordance with said binary element information data, said element forming the half-tone reproduction of the varying tone of



the original image at the desired screen frequency and angle, there being one binary element formed in response to each binary element information datum; and

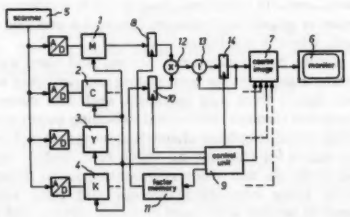
D. the step of digitally comparing including addressing said screen matrix information data, there being a plurality of address bits that are incremented by a certain value for each binary element formed along the lines on the member and said certain value including a round-off error, said addressing including using a group of the most significant address bits to address each screen matrix information datum and providing a sufficient number of address bits to avoid said round-off error affecting said group of most significant address bits until beyond the end of said image lines.

4,533,942

METHOD AND APPARATUS FOR REPRODUCING AN IMAGE WHICH HAS A COARSER RESOLUTION THAN UTILIZED IN SCANNING OF THE IMAGE

Winrich Gall, Klausdorf, and Peter Weselmann, Hamburg, both of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed May 12, 1983, Ser. No. 493,817
Claims priority, application European Pat. Off., May 28, 1982, 82-104691.9
Int. Cl.³ H04N *1/46, 5/14, 1/40*; G03F *3/10*
U.S. Cl. 358—78 **8 Claims**



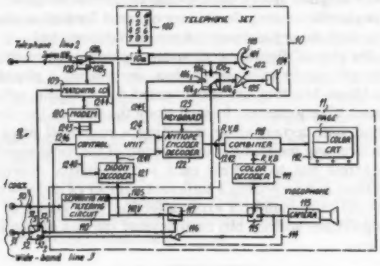
1. The method for reproducing images with a coarser resolution than the image, which is scanned, whereby the original image is opto-electronically scanned point-wise and line-wise with a predetermined resolution to obtain digital image signals, wherein a field which contains as many fine image points as are included in a coarse image point is extracted from the digital image signals, wherein the individual image signals of the fine image points of said field are weighted with a weighting func-

tion and wherein the weighted image signals are combined to obtain the image signal for a coarse image point, the weighting and combination of the image signals comprising, serially weighting the fine image points point by point, storing the first weighted image signal, reading out the first weighted image signal, adding and storing the second weighted image signal to the previously read out first weighted image signal, reading out the sum of the first and second weighted signals, adding and storing the sum of the first and second weighted signals with the next weighted signal and repeating this reading out and adding process until the last weighted image signal of the field is processed and weighting the final sum of the weighted fine image points according to the number of the fine image points of the field.

4,533,943
VIDEOCOMMUNICATION NETWORK BETWEEN VIDEOPHONE TERMINALS AND A PICTURE BANK

Alain Poirier, 82, rue de la République, Meudon, France (92190)

Filed Jul. 6, 1983, Ser. No. 511,385
Claims priority, application France, Jul. 30, 1982, 82 13419
Int. Cl.³ H04M *11/08*; H04N *7/14*
U.S. Cl. 358—85 **15 Claims**



1. A videocommunication network comprising plural (N) videophone terminals and a picture bank,

videophone terminal K comprising: first switching means, audiofrequency means for transmitting and receiving audiofrequency signals of a telephone communication, said audiofrequency means being connected through said first switching means to a bidirectional telephone channel videofrequency means connected to a wide-band transmitting channel for transmitting videofrequency signals and connected to a wide-band receiving channel for receiving videofrequency signals, and data means for transmitting and receiving first data signals through said first switching means and said telephone channel while a videocommunication is established between terminal k and said picture bank, where k is selectively each of 1 . . . N;

said picture bank comprising: second and third switching means, data means for transmitting and receiving said first data signals from said terminals, said data means being connected through said second switching means to several bidirectional telephone channels serving said picture bank, and means for transmitting vision representing signals to said terminals, said vision representing signal transmitting means being connected through said third switching means to several wide-band channels serving said picture bank, several multiplexing means connected to be responsive to signals from said second and third switching means and to supply signals to said several wide-band transmitting channels for sequentially transmitting a second data signal peculiar to releasing said telephone channels carrying said first data signals as derived from said second switching means and third data signals multiplexed with a vision signal as derived from said third switching means, the transmission of the multiplexing means occurring after said videocommunication between one of said videophone terminals and said picture bank has been established, said picture bank data means being connected through said second switching means to one of said several wide-band channels for receiving third data signals from said terminal after said telephone channels have been released;

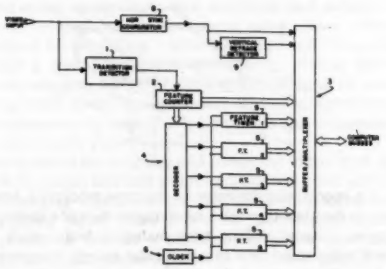
videophone terminal k further comprising: means connected to said wide-band receiving channel of terminal k for detecting said second and third data signals transmitted from said picture bank multiplexing means and for delivering the detected second and third data signals to said terminal data receiving means, fourth switching means for selectively connecting said terminal wide-band transmitting channel to said videofrequency transmitting means for a videophone communication with another videophone terminal and to said terminal data transmitting means in response to said second data signal being detected,

said first switching means of said videophone terminal being selectively connected to said audiofrequency transmitting and receiving means and to said terminal telephone channel in response to said second data signal being detected.

4,533,944
VIDEO MEASUREMENT SYSTEM FOR MICROCOMPUTER

John E. Eby, Ipswich, and Charles M. Kingston, Georgetown, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 2, 1983, Ser. No. 548,112
Int. Cl.³ H04N *7/02, 9/62*
U.S. Cl. 358—107 **2 Claims**



1. A video measurement system for coupling between a source of video signal and a computer buss and for quantizing information contained in a video signal and conditioning that information for a memory device such as might be comprised by a microcomputer, said system comprising:

a transition detector having an input for coupling to said source of video signal, said transition detector providing at its output a signal indicative of Black-to-White and White-to-Black transitions in the peak brightness level of the video signal,

a feature counter having an input coupled to the output of the transition detector and an output for coupling to the computer buss, said feature counter providing at an other output a signal representative of the number of Black-to-White and White-to-Black transitions in the video signal,

a decoder having an input coupled to an output said other of the feature counter and at least N individual outputs,

N individual feature timers, each having an ENABLE input coupled to a decoder output and an output for coupling to the computer buss, and

a clock having an output coupled to a CLOCK input of each of the feature timers, whereby the decoder operates in response to said output of the feature counter to selec-

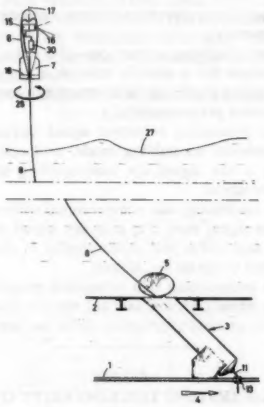
tively enable individual ones of the feature timers as determined by the transitions in the video signal so that the feature timers provide outputs representative of the duration between transitions in the video signal.

4,533,945

PROCESS AND ARRANGEMENT FOR AERIAL OBSERVATION AND/OR COMMUNICATION FOR A SUBMERGED SUBMARINE

Georges R. P. L. Lauvray, Versailles, and Michel J. P. Darche, Ville d'Avray, both of France, assignors to Societe ECA, France

Filed Dec. 17, 1982, Ser. No. 450,673
Claims priority, application France, Dec. 22, 1981, 81 23958
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—109 **14 Claims**



1. A process of aerial observation and/or communication for a submerged submarine, utilizing a floating body equipped with observation and/or communication means and connected to the submarine by a retaining cable, which in addition is used for the transmission of the observation and/or communication signals between the floating body and the submarine, which process consists in releasing the floating body, which is initially held on board the submarine and consists of an apparatus of high buoyancy and low drag, in such a manner as to cause it to rise rapidly to the surface, pass through the surface and spring out of the water, bringing its observation and/or communication means into operation at least during the aerial phase of its trajectory, imparting to the body during its upward movement, a rotary motion about a vertical axis which continues after it is out of the water, the observation and/or communication means being arranged so that they aim in a direction at right angles to the axis, and then bringing it back on board the submarine by hauling back the connecting cable.

4,533,946

DIAGNOSTIC X-RAY APPARATUS

Hiroshi Yasuhara; Hitoshi Fujita, and Kiyoshi Okazaki, all of Ootawara, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 1, 1983, Ser. No. 463,003
Claims priority, application Japan, Mar. 9, 1982, 57-35848
Int. Cl.³ H06N *7/18*
U.S. Cl. 358—111 **2 Claims**

2. A diagnostic X-ray apparatus for producing visible difference images from pulsed X-ray images obtained from pulsed X-radiation, comprising:

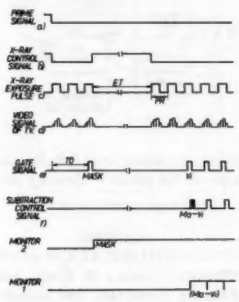
an X-ray generating source for emitting pulsed X-radiation to produce a pulsed X-ray image;

television means including a television camera for converting said X-ray image into a series of video signals;

synchronizing generating means for generating vertical framing signals at a vertical frame rate of said television camera;

exposure control means responsive to said vertical framing signals for generating X-ray exposure control signals to control the exposure time of the X-radiation emitted from said X-ray generating source;

sequence control means including an analog-to-digital convertor for causing selected analog video signals corresponding to a later complete television image and which are at a sufficiently high level after a new pulsed X-ray exposure to be converted into corresponding digital video



signals by means of the analog-to-digital convertor by ignoring the successive television images preceding said selected television image;

a digital memory system including at least two digital memory means for storing and integrating said digital video signals in a predetermined sequence;

subtracting means for producing digital difference video signals by performing a subtraction between digital video signals recently stored in said digital memory system and preceding digital video signals previously stored in said digital memory system;

a digital-to-analog convertor for converting said digital difference video signals into analog difference video signals; and,

a television display means for producing visible difference images corresponding to said analog difference signals.

4,533,947

ADAPTABLE AREA FOR IMAGE STORAGE

Kendall A. Smith, Chagrin Falls, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Nov. 14, 1983, Ser. No. 550,835
Int. Cl.³ A61B *6/02*
U.S. Cl. 358—111 **6 Claims**

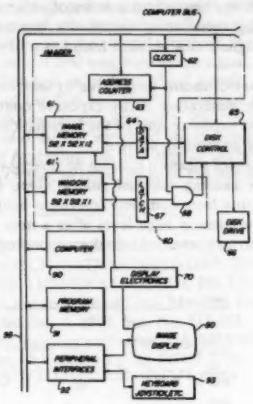
1. In a radiographic imaging apparatus of the type having a computer controlled image memory for storing a large matrix image whose contents are transferrable to a storage medium, a system for reducing data transfer between said memory and said storage medium without degrading image quality comprising:

(a) a window memory means of preselected matrix size;

(b) means for generating in said window memory means an array of control bits, each corresponding to at least one matrix element in the image memory wherein each of said bits designates either acceptance or deletion of the corresponding matrix element in the image memory; and

(c) means connected to both the image memory and said win-

dow memory for transferring to the storage medium only data from the image memory which are stored in matrix



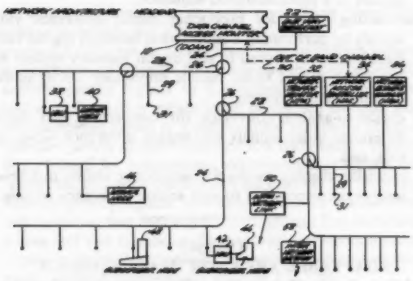
elements having an acceptance bit in the corresponding matrix elements in the window memory means.

4,533,948

CATV COMMUNICATION SYSTEM

Robert P. McNamara; Gregory B. Ennis, both of San Jose; Richard J. Feiertag, Sunnyvale, and Robert K. Bauer, Fremont, all of Calif., assignors to General Instrument Corporation, New York, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,765
Int. Cl.³ H04N *7/16*
U.S. Cl. 358—122 **11 Claims**



1. A CATV headend apparatus comprising:

means for receiving a message from a source node, said received message including a frame verifier code;

means coupled to said receiving means and rebroadcasting said received message in essentially real time from said CATV headend apparatus;

means responsive to said receiving means for examining said frame verifier code and for providing an output signal which indicates whether or not said source node is authorized to utilize CATV communication resources; and

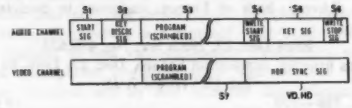
means responsive to said output signal from said examining means for preventing said rebroadcasting means from rebroadcasting said received message if said output signal indicates that said received message including said frame verifier code is received from a source node that is not authorized to utilize CATV communication resources.

4,533,949

SUBSCRIPTION TELEVISION SYSTEM

Yasushi Fujimura, Musashino; Takashi Okada, Yokohama, and Kazuo Yamagiwa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 415,836
Claims priority, application Japan, Sep. 10, 1981, 56-142836; Sep. 10, 1981, 56-142837
Int. Cl.³ H04N *7/16*; H04K *1/04*
U.S. Cl. 358—122 **19 Claims**



1. A subscription television system requiring time-shifted viewing comprising,

means for scrambling at least one of a video signal and an audio signal for a specific television program in accordance with a predetermined scrambling mode to produce a scrambled program signal,

means for generating a control signal in response to said predetermined scrambling mode, said control signal including a key signal for unscrambling said scrambled program signal,

means for combining said control signal with said scrambled program signal such that said key signal is appended to one of said video and audio signals at the end of said scrambled program signal; and

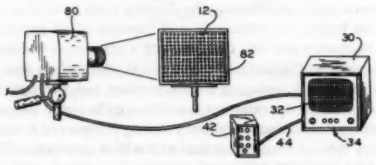
means for transmitting said scrambled program signal and said key signal such that said key signal is transmitted after all of said scrambled program signal has been transmitted.

4,533,950

METHOD OF TESTING THE LINEARITY OF A RASTER SCAN

John H. Harshbarger, Xenia, Ohio, assignor to Visual Information Institute, Inc., Xenia, Ohio

Filed Mar. 23, 1983, Ser. No. 478,157
Int. Cl.³ H04N *7/02*
U.S. Cl. 358—139 **25 Claims**



1. A method of testing the raster scan geometry of a television display apparatus having a screen comprising:

providing to the television display apparatus an electrical signal corresponding to a selected scan rate and generated by means of an electronic test pattern generator which produces on the raster scan of the television display apparatus a plurality of the reference images arranged in a plurality of orthogonal horizontal rows and vertical columns and adjusting the spacing of the horizontal rows by selecting a particular scan rate from the plurality of available scan rates for the electrical signal provided to the television display apparatus,

providing a plurality of linearity test chart transparencies matched to a plurality of respective scan rates, each said transparency comprising a plurality of horizontal rows and vertical columns of substantially identical graphic

elements on a background, each element comprising at least two concentric annuli surrounding a circular center space,

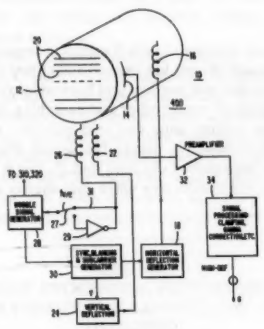
selecting from the plurality of transparencies a transparency matching the scan rate of the signal provided to the television display apparatus and projecting an image of the transparency on the screen of the television display apparatus such that as many of the reference images as possible are located at the centers of the respective graphic elements, whereby the linearity of the scan geometry can be determined by noting the number of reference images which lie within the respective graphic elements and the positions of said reference images which lie within the graphic elements relative to the respective concentric annuli and center spaces.

4,533,951

SYSTEM FOR GENERATING AND DISPLAYING A COMPATIBLE HIGH DEFINITION TELEVISION SIGNAL BY PROGRESSIVE SCANNING

Kerns H. Powers, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 27, 1982, Ser. No. 424,232
Int. Cl.³ H04N *7/04*
U.S. Cl. 358—141 **17 Claims**



1. In a high-definition television system compatible with a television receiver having capability of operating in respsonse to a limited-bandwidth signal, said system being used to display an image in a linear manner or in a wobble manner wherein said image is scanned in a wobble fashion, the system comprising:

scanning means for scanning an image at a first predetermined rate in a first direction and at a second predetermined rate in a second direction orthogonal to said first direction;

selecting means for selecting non-adjacent time successive picture elements scanned in said first direction, said picture elements being selected from non-adjacent positions in said second direction, said selecting means in combination with said scanning means effecting a wobble scanning of said image such that said image is sub-scanned in said second direcion at a third rate, which is an integer multiple of one-half of said first predetermined rate, greater than said first rate, thereby producing a high resolution scan in said first and second directions, whereby when said integer is chosen to be a first predetermined integer, unscanned regions of a given field of said image observed on a display scanned in said wobble manner are not overlaid by scanned regions of a field which is successive in time to said given field thereby creating visible patterns which tend to be objectionable, wherein said integer is chosen to be a second predetermined integer, said second predetermined integer affecting said image observed in a display scanned in said wobble manner such that said image lacks full resolution; and

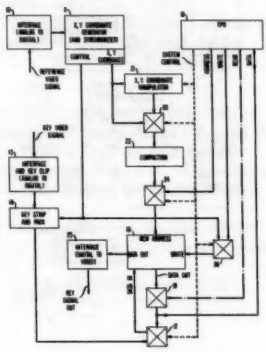
inverter means for switching said selecting means at one-half of said second predetermined rate such that said selecting means selects alternate non-adjacent, time successive picture elements scanned in said first direction to effect full resolution of said display.

4,533,952

DIGITAL VIDEO SPECIAL EFFECTS SYSTEM

James W. Norman, III, Gainesville, Fla., assignor to Digital Services Corporation, Gainesville, Fla.

Filed Oct. 22, 1982, Ser. No. 436,066
Int. Cl.³ H04N *5/14, 9/535*
U.S. Cl. 358—160 **17 Claims**



1. In a video processing system of the type wherein video information is stored in a memory having a plurality of storage locations for storing respective predetermined portions of a video signal, each storage location having an associated memory address in the form of a memory address coordinate pair, a memory address coordinate manipulator arrangement comprising:

function register means for receiving function data corresponding to a selected mathematical function representative of a desired displacement of a selected one of the predetermined portions of the video signal with respect to the associated storage location in the memory;

input means for receiving the memory address coordinate pair corresponding to said selected one of the portions of the video signal which is desired to be displaced;

arithmetic means for combining said function data and said memory address coordinate pair corresponding to said selected one of the portions of the video signal in accordance with a predetermined sequence of arithmetic steps for producing a solution to a generalized displacement equation; and

offset register means for receiving offset data corresponding to a desired fixed displacement of said selected one of the predetermined portions of the video signal.

4,533,953

SIGNAL ANALYZING CIRCUIT FOR A PERIODICALLY OCCURRING SIGNAL

Frederik J. Van Roessel, Upper Saddle River, N.J., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,075
Claims priority, application Netherlands, Dec. 23, 1981, 8105800
Int. Cl.³ H04N *5/14, 5/34, 5/21*
U.S. Cl. 358—160 **7 Claims**

1. A circuit for analyzing a number of distinct portions of a

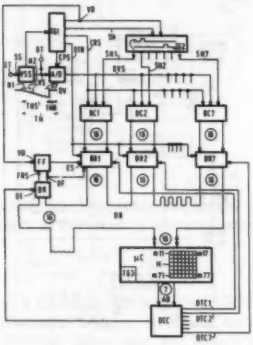
signal during a consecutive number of signal periods comprising:

a signal source for generating said signal;

an analog to digital converter connected to receive said signal for producing a pulse train having a frequency proportional to said signal magnitude;

a plurality of counters equal in number to said number of distinct portions, said counters operative sequentially and periodically for counting pulses of said pulse train during said distinct portions of each signal period contained in the consecutive signal periods, said counters having parallel outputs for supplying the counting signal;

a plurality of buffer registers connected to said counter outputs;



a time signal generator controlled by said signal source to produce clock signals in synchronism with said signal, said clock signals controlling the counting of said counters, and controlling said buffer registers for transferring the contents of said counters to said buffer registers at the end of the last of said signal periods, and for resetting said counters; and

store means having a number of separate storage locations which are a multiple of said number of distinct portions for storing the count result obtained for each portion of each of said periods, whereby information corresponding to the signal voltages occurring in one of said distinct portions of each of said signal periods is made available.

4,533,954

SOLID STATE IMAGE PICKUP APPARATUS

Mitsuo Soneda, Zama, and Toshikazu Maekawa, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP83/00031, § 371 Date Oct. 4, 1983, § 102(e) Date Oct. 4, 1983, PCT Pub. No. WO83/02868, PCT Pub. Date Aug. 18, 1983

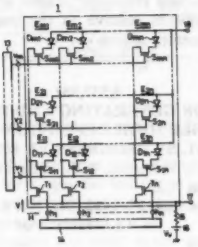
PCT Filed Feb. 5, 1983, Ser. No. 551,990

Claims priority, application Japan, Feb. 5, 1982, 57-17245

Int. Cl.[3] H04N *5/79*

U.S. Cl. 358—212 1 Claim

1. A solid state image pickup apparatus comprising an image pickup surface composed of a plurality of image pickup picture units each of which contains a switching device and a photoelectric converter arranged in a matrix of horizontal rows and vertical columns, a shutter which is periodically opened and closed to simultaneously supply light to all of said photoelectric converters, a vertical switch control with a plurality of outputs each respectively connected to sequentially turn on the switching elements of common horizontal rows after said shutter has been opened and closed, a plurality of horizontal switch means respectively connected to said columns of switching devices, a horizontal switch control connected to



said plurality of horizontal switch means to sequentially switch them on after said shutter has opened and closed to remove the image charges and said vertical and horizontal switch controls supplying signals to render all of said switching devices of said image pickup picture units and said plurality of horizontal switch means conductive during the period after said image charges have been shifted out until said shutter is openend and renders them non-conductive when said shutter is open.

4,533,955

Patent Not Issued For This Number

4,533,956

APPARATUS FOR CONVERTING FACSIMILE CODED DATA TO VIDEO DATA

Mickiel P. Fedde, Eagan, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Filed Sep. 17, 1982, Ser. No. 420,564

Int. Cl.[3] H04N *1/00*

U.S. Cl. 358—260 4 Claims

1. An apparatus for converting facsimile coded data to video data, comprising:

a programmed digital computer for receiving said facsimile coded data, buffering said facsimile coded data and converting said facsimile coded data to a fixed length intermediate code; and

a video convertor responsive to said programmed digital

computer for converting said fixed length intermediate code to video data;

wherein said programmed digital computer comprises:

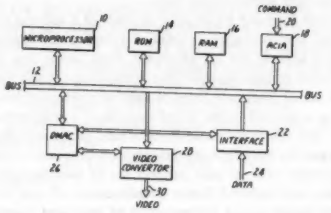
a microprocessor capable of executing a series of instructions;

a read only memory coupled to said microprocessor containing said series of instructions and being capable of supplying said instructions to said microprocessor;

an interface module for receiving said facsimile coded data;

a randomly accessible memory coupled to said interface module and to said microprocessor for holding and buffering said facsimile coded data and for holding a table lookup for converting said facsimile coded data to said intermediate code;

a direct memory access controller coupled to said microprocessor, coupled to said randomly accessible memory, coupled to said interface module and coupled to said video convertor, said direct memory access controller for transferring facsimile coded data from said interface module to said randomly accessible memory and for transferring said intermediate code from said randomly accessible memory to said video convertor, said transferring being under control of said microprocessor.



4,533,957

METHOD OF PROCESSING PICTURE SIGNAL TO INCREASE AVERAGE RUN LENGTH AND APPARATUS THEREFOR

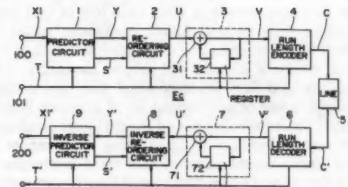
Kazumoto Iinuma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 26, 1983, Ser. No. 526,588

Claims priority, application Japan, Aug. 26, 1982, 57-148425

Int. Cl.³ H04N *1/40, 7/12*

U.S. Cl. 358—261 **12 Claims**



1. A method of processing a picture signal comprising the steps of:

generating a prediction error signal for each of a plurality of picture elements to be encoded, said prediction error signal being based on a plurality of previously encoded picture element data and indicating correct and incorrect predictions;

assigning one of first and second probability states to each of said prediction error signals;

classifying the prediction error signals into two groups according to the probability state assigned thereto;

storing said two groups in a memory area in a manner that said prediction error signals assigned said first probability state are stored in ascending chronological order and said prediction error signals assigned said second probability state are stored in descending chronological order;

reordering the prediction error signals by

(a) listing in ascending chronological order the classified prediction error signals until an incorrectly predicted error signal is detected, and

(b) subsequently listing in ascending order said classified prediction error signals in descending chronological order until a subsequent incorrectly predicted error signal is detected, and

(c) repeating steps (a) and (b) until all of the prediction error signals are listed; and

run length coding said prediction error signals based on the incorrectly predicted error signals in the list.

4,533,958

METHOD OF TRANSMITTING SERIAL DATA BETWEEN FACSIMILE EQUIPMENT AND INTERFACE PERFORMING THE SAME

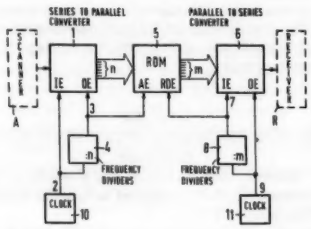
Werner Herget, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 506,967

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229777

Int. Cl.³ H04N *1/40, 1/04*

U.S. Cl. 358—280 **11 Claims**



2. An interface ciruit arrangement for transforming binary encoded data being exchanged in form of a serial data stream between a transmitting and a receiving facsimile transceiver both having different horizontal resolutions, and circuit arrangement comprising:

means for receiving the serial data stream generated by the transmitting facsimile transceiver while scanning an original document and for separating subsequent portions of the data stream each representing a scanning line into a respective sequence of first data words each composed of n bits;

means for evaluating the bit pattern of each first data word by determining the number and type of subsequent bit changes thereof;

means for deriving therefrom a coincident sequence of second data words each composed of m bits by reproducing substantially said bit pattern of each corresponding first data word while arbitrarily padding of an insignificant bit if the resolution of the receiving facsimile transceiver is higher and consequently n is lower than m and by arbitrarily dropping of an insignificant bit, respectively

if the resolution of the transmitting transceiver is higher and consequently n is higher that m, whereby n:m corresponds to the ratio of the different horizontal resolutions; and

means for forming a serial stream of transformed data from

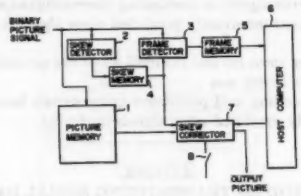
the sequence of said second data words and transmitting the same to the receiving facsimile transceiver.

4,533,959

PICTURE PROCESSING APPARATUS

Akira Sakurai, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,718
Claims priority, application Japan, Nov. 19, 1981, 56-186052
Int. Cl.³ H04N 1/40
U.S. Cl. 358—280 4 Claims



1. A picture processing apparatus comprising;

a picture memory for storing a quantized picture of an original, which original includes skew detection marks;

a skew detector for detecting the skew of the quantized picture by the skew detection marks on the original;

a frame detector for detecting the frame in which the picture on the original is enclosed;

a picture-processing area designation apparatus for designating the portion of the picture to be processed and edited in accordance with the frame detection information obtained from said frame detector;

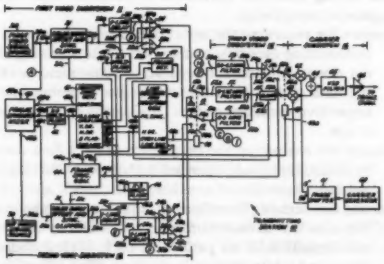
and a skew corrector for reproducing the quantized picture within the area designated by said picture-processing area designation apparatus, with correction of skew, if any, from said picture memory.

4,533,960

SYSTEM FOR ENCODING AND DECODING VIDEO SIGNALS

Jerome J. Tiemann; Scott E. Cutler, and Kenneth B. Welles, II, all of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 416,427, Sep. 9, 1982, abandoned. This application Oct. 21, 1982, Ser. No. 435,792
Int. Cl.³ H04N 5/782, 9/32
U.S. Cl. 358—310 19 Claims



1. In combination:

means for providing a first luminance signal comprising a plurality of successive lines having a line scanning frequency of a first predetermined value, said plurality of lines consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of a first predetermined time, said first luminance signal having frequencies extending over a band of frequencies from zero frequency to a first predetermined frequency,

means for forming a plurality of lines of a first composite signal, said plurality of lines of said first composite signal consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, each line of said first set of alternate lines of said first composite signal being a first linear combination of a respective line of said first set of alternate lines of said first luminance signal delayed by said first predetermined time and a respective successive line of said second set of alternate lines of said first luminance signal, each line of said second set of alternate lines of said first composite signal being zero,

means for forming a plurality of lines of a second composite signal, said plurality of lines of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, each line of said first set of alternate lines of said second composite signal being a second linear combination of a respective line of said first set of alternate lines of said first luminance signal delayed by said first predetermined time and a respective successive line of said second set of said first luminance signal, said second linear combination of said first luminance signal being independent of said first linear combination of said first luminance signal, each line of said second set of alternate lines of said second composite signal being zero,

means for providing a second luminance signal comprising a plurality of successive lines having a line scanning frequency of said first predetermined value, said plurality of lines consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, said second luminance signal having frequencies extending over a band of frequencies from zero frequency to a first predetermined frequency,

means for forming a plurality of lines of a third composite signal, said plurality of lines of said third composite signal consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, each line of said first set of alternate lines of said third composite signal being a third linear combination of a respective line of said first set of alternate lines of said second luminance signal delayed by said first predetermined time and a respective successive line of said second set of alternate lines of said second luminance signal, each line of said second set of said third composite signal being zero,

means for forming a plurality of lines of a fourth composite signal, said plurality of lines of said fourth composite signal consisting of a first set of alternate lines and a second set of alternate lines, each line having a duration of said first predetermined time, each line of said first set of alternate lines of said fourth composite signal being a fourth linear combination of a respective line of said first set of alternate lines of said second luminance signal delayed by said first predetermined time and a respective successive line of said second set of alternate lines of said second luminance signal, said fourth linear combination of said second luminance signal being independent of said third linear combination of said third luminance signal, each line of said second set of said fourth composite signal being zero,

means for interleaving the lines of said first set of alternate lines of said first composite signal and said first set of alternate lines of said third composite signal to provide a fifth composite signal,

means for interleaving the lines of said first set of alternate lines of said second composite signal and said first set of alternate lines of said fourth composite signal to provide a sixth composite signal,

means for filtering said fifth composite signal to provide a seventh composite signal having frequencies less than a second predetermined frequency, said second predeter-

mined frequency being less than said first predetermined frequency,

means for filtering said sixth composite signal to provide an eighth composite signal having frequencies less than a third predetermined frequency, said third predetermined frequency being substantially less than said second predetermined frequency,

means for transmitting each of the lines of said seventh composite signal to a transmission channel,

means for transmitting each of the lines of said eighth composite signal to said transmission channel.

4,533,961

MAGNETIC RECORDING APPARATUS WITH LEVEL ADJUSTING MEANS FOR MIXED LUMINANCE, CHROMINANCE, AUDIO AND PILOT SIGNALS

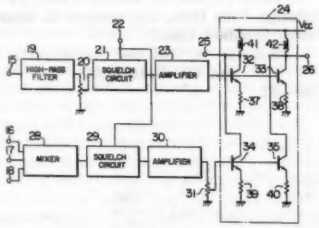
Akira Shibata; Isao Wada, and Atsushi Yoshioka, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 1, 1983, Ser. No. 481,252

Claims priority, application Japan, Apr. 2, 1982, 57-53819; Jul. 7, 1982, 57-116790

Int. Cl.³ H04N *9/491, 9/493*

U.S. Cl. 358—315 **3 Claims**



1. A magnetic recording apparatus for recording on a video track of a magnetic tape a composite signal produced by frequency multiplexing a frequency-modulated luminance signal component, a chrominance signal component, a frequency-modulated audio signal component and a pilot signal component, said apparatus comprising:

first mixing means for receiving and mixing at least two of said signal components forming said composite signal and producing a mixed signal;

first signal level adjusting means for receiving said mixed signal and adjusting the signal level thereof;

second signal level adjusting means for receiving the remainder of the signal components of said composite signal and adjusting the signal level thereof;

second mixing means for receiving and mixing an output signal from said first signal level adjusting means and an output signal from said second signal level adjusting means and thereby producing said composite signal; and

video head means for receiving said composite signal from said second mixing means and recording the same on the video track of said magnetic tape.

4,533,962

VEHICLE PERFORMANCE DETECTION AND RECORDING APPARATUS

Ronald R. Decker, 5548 S. Telluride St., Aurora, Colo. 80015, and William T. Shannon, 1812 Canyon Blvd., Boulder, Colo. 80301

Filed Aug. 5, 1982, Ser. No. 405,591

Int. Cl.³ G11B *5/00*

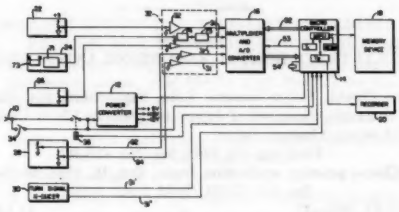
U.S. Cl. 360—5 **15 Claims**

1. In a self-contained vehicle performance recorder system wherein a plurality of transducer means are operative to produce a succession of signals as a function of time representative of vehicle performance parameters including speed, braking rate, steering rate and acceleration of the vehicle under operating conditions, the improvement comprising:

control circuit means including conditioning means for converting said succession of signals into a series of data blocks, each block containing a signal representative of each parameter measured;

programmer means for generating a succession of record numbers and for addressing said control circuit means to order out each said series of data blocks received from said transducer means and correlating said record numbers therewith;

means for temporarily storing each said record number in correlated relation with each said series of data blocks in succession ordered out of said control circuit means; and



recorder means for writing each said series of data blocks stored onto a record medium over a predetermined time period, said programmer means including means to generate a write command signal to activate said recorder means for writing each said series of data blocks at spaced time intervals within said time period, means to generate a reference timing signal for recording on said recording medium in correlated relation to each said record number and each said series of data blocks recorded, and means for erasing said series of record numbers and corresponding data blocks recorded over said predetermined time period, and said recorder means operative to write each next succession of record numbers and corresponding data blocks received from said transducer means over a next predetermined time period corresponding to said first predetermined time period.

4,533,963

VIDEO TAPE RECORDER FOR RE-RECORDING AUDIO SIGNALS

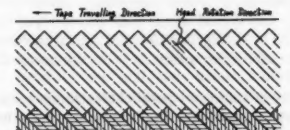
Kenji Nakano, Ebina; Takao Takahashi, Sagamihara; Hisayoshi Moriwaki, Isehara, and Keiichiro Shimada, Fujisawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,390

Claims priority, application Japan, Jan. 25, 1982, 57-9850

Int. Cl.³ G11B *27/02, 5/49*

U.S. Cl. 360—19.1 **9 Claims**



1. A magnetic recording and/or reproducing apparatus having at least a pair of rotary magnetic transducing heads for producing information tracks on a magnetic recording me-

dium, each of said information tracks comprising a video signal track portion and an audio signal track portion, said transducing heads having respective azimuth angles which are different from each other and a width of said transducing heads being larger than that of said information tracks, comprising:

means for re-recording an audio signal in substantial positional correlation with a recorded audio signal track portion,

means for generating a non-audio identification signal for identifying re-recorded audio track portions,

means for recording said identification signal in said audio track portion of an information track on said magnetic recording medium in lieu of said audio signal,

means for detecting said identification signal, and

means for compensating a reproduced audio signal in response to said identification signal.

4,533,964

MULTI-TRACK DIGITAL RECORDING AND PLAYBACK SYSTEM

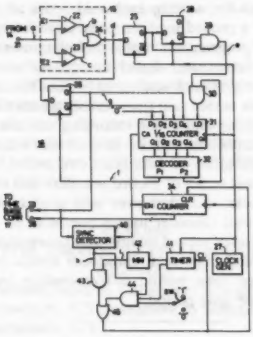
Isao Owaki, Tokyo; Susumu Saito, Sagamihara, and Masami Yamazaki, Zama, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Sep. 30, 1982, Ser. No. 432,384

Claims priority, application Japan, Oct. 15, 1981, 56-164500

Int. Cl.³ G11B *15/02, 5/43, 5/09*

U.S. Cl. 360—22 **11 Claims**



1. A digital recording and playback system comprising:

means for converting an analog signal to a digital signal comprising a data word and a synchronization word;

means for distributing said digital signal to a plurality of circuit paths;

means for transforming the digital signal in each of said circuit paths into a non-return-to-zero inverted (NRZI) signal;

delay means for delaying said digital signal by a period of one binary digit for producing a delayed digital signal,

said transforming means comprising adder means for combining said digital signal with said delayed digital signal;

means for inverting said delayed digital signal for application to said adder means for combination with said digital signal;

a plurality of stationary parallel electromagnetic transducers respectively associated with said circuit paths and spaced apart at least by the width of a track for recording the distributed NRZI signals along a plurality of spaced apart longitudinally extending first tracks of a magnetic tape when the tape is driven toward one end thereof and along a plurality of spaced apart longitudinally extending second tracks interleaved with said first tracks when the tape is driven toward the other end thereof, each of said transducers having a differential characteristic with which the recorded signal is detected as a waveform having three distinguishable levels when the system operates in a playback mode;

means coupled to said transducers for converting said waveform to a binary signal to recover the original digital signal;

means for detecting said synchronization word from the recovered digital signal to generate a timing signal indicative of the position of each binary digit of the data word with respect to the detected synchronization word;

means responsive to said timing signal for aligning the timing of each binary digit derived from each transducer with binary digits derived from the other transducers;

means for arranging said time-aligned data words into a series of successive data words; and

means for converting said series of data words to an analog signal.

4,533,965

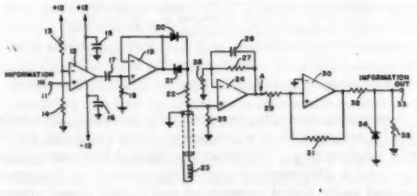
MAGNETIC READ/WRITE CIRCUIT

Gary Steinbaugh, Villa Hills, Ky., assignor to General Signal Corporation, Stamford, Conn.

Filed Apr. 18, 1984, Ser. No. 601,417

Int. Cl.³ G11B *15/02*

U.S. Cl. 360—62 **9 Claims**



1. An automatic read to write or write to read switching electronic recording and playback circuit for recording and playing back digital information, said circuit comprises:

(a) a high press filter for preventing the passage of low frequency signals; the input of said filter is coupled to said information;

(b) a first amplifier that reproduces its input signal, the positive input of said amplifier is coupled to the output of said high pass filter;

(c) a first diode whose anode is coupled to the output of said first amplifier;

(d) a second diode whose cathode is coupled to the anode of said first diode and to the output of said first amplifier and whose anode is coupled to the cathode of said first diode so that said first amplifier and said first and second diodes will act like an automatic switch;

(e) means for recording or reading information on a magnetic material, said means writes information when said means receives signals from said second diode and said means is completely disconnected from said second diode when it is not receiving signals;

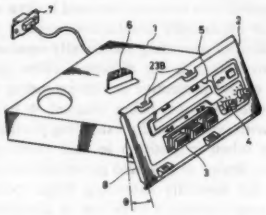
(f) a second amplifier whose input is coupled to said means for recording or reading information on a magnetic material, and whose output is coupled to the negative input of said second amplifier; and

(g) a third amplifier whose positive input is coupled to the output of said second amplifier; said third amplifier shapes its input signals into a series of square waves.

4,533,966
TAPE PLAYER FOR VEHICLES

Masato Kume, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,437
Claims priority, application Japan, Sep. 21, 1981, 56-140290[U]
Int. Cl.³ G11B *15/32, 5/40*
U.S. Cl. 360—96.5 9 Claims



1. A weatherproof housing for a cassette tape player comprising:

a casing for acceptingly receiving a tape player therein and having one open side;

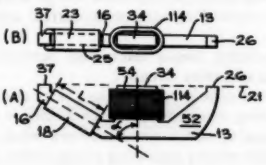
movable cover means for sealingly covering said open side of said casing and operable between a first or covering position sealing the interior of said housing and a second or exposing position exposing at least the cassette insertion aperture of tape player placed in said housing to permit insertion of a cassette into said player; and

a pair of biased latching means for holding said cover means in either said covering or exposing positions, each said latching means including a first and a second elongated link pivotally joined together at first ends thereof and respectively pivotally joined to said cover means and an interior portion of said housing at second ends thereof, each said latching means including spring biasing means coupled to said second link for urging said second link in either extreme position thereof to hold said cover in either said aperture covering or said aperture exposing position.

4,533,967
MULTIPLE LEG MULTICHANNEL MAGNETIC TRANSDUCER STRUCTURE AND METHOD OF MANUFACTURING

Ralph A. Conly, Sunnyvale, and Stanley M. Latimer, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Oct. 22, 1982, Ser. No. 436,084
Int. Cl.³ G11B *5/20*
U.S. Cl. 360—123 22 Claims



1. A multichannel magnetic transducer assembly having at least two closely spaced parallel transducing channels, each channel having a magnetic core with poles defining a transducing gap and a multiple leg back core contiguous with the poles, each leg providing a separate flux path, comprising in combination:

(a) each channel having two separate corresponding core portions made of a generally flexible magnetic material, each core portion comprising a magnetic pole, at least one intermediate leg portion, and a rear leg portion, said respective leg portions being contiguous with the pole, said magnetic pole and leg portions having smoothly lapped end faces defining a transducing gap plane;

(b) said rear leg portion of each core portion extending at an acute angle with respect to said intermediate leg portion and converging towards said transducing gap plane;

(c) respective transducing coils provided on at least one intermediate and one rear leg portion of said corresponding core portions of each channel; and

(d) said corresponding core portions of each channel being assembled with said end faces of said corresponding intermediate and rear leg portions abutting and with said magnetic poles defining a transducing gap therebetween.

4,533,968
CERAMIC GUIDES FOR TAPE-LIKE MATERIALS AND PROCESS FOR THE PRODUCTION THEREOF

Tuneo Yoshida; Kengo Oishi, and Motohiko Yagi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

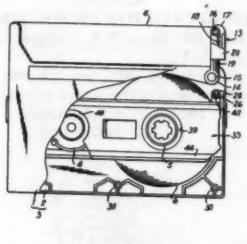
Filed Sep. 29, 1982, Ser. No. 428,510
Claims priority, application Japan, Sep. 29, 1981, 56-152939
Int. Cl.³ G11B *15/60*
U.S. Cl. 360—130.21 3 Claims

1. A ceramic guide for tape-like materials, comprising a sintered molding of (A) 98 to 93 parts by weight of barium titanate, (B) 2 to 7 parts by weight of an inorganic silicate binder, and (C) 0.2 to 2 parts by weight, per 100 parts by weight of (A) and (B), of lanthanum oxide.

4,533,969
TAPE CASSETTE ANTI-STATIC MEMBER

Takao Miyashita, and Toshio Sato, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1983, Ser. No. 463,807
Claims priority, application Japan, Feb. 5, 1982, 57-15088[U]
Int. Cl.³ G11B *23/02, 23/04*
U.S. Cl. 360—132 6 Claims



1. A tape cassette comprising a housing having a locating hole for cooperating with a grounded conductive locating pin in an apparatus that accepts the cassette to correctly position said cassette in said apparatus; a pair of tape reels rotatably mounting two coils of tape in substantially co-planar, side-by-side relation in said housing with a substantial portion of the tape edge exposed; and anti-static means including a strip of conductive sheet material spanning substantially the entire diameters of both coils of tape and being curved in transverse cross-section for flexure of said strip between the tape coils and the inside surface of said housing, said strip having two portions folded into mutually facing relation to embrace said tape coils and bear against opposite edges of said tape therein, each said portion of the strip including slide means for slidably engaging the edges of the tape coils, and grounding means including a tab on said strip extending into said locating hole for contacting the conductive locating pin when the cassette is installed in the apparatus and thereby connecting said strip to

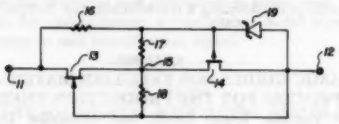
ground outside said housing, said tab being integral with one of said portions and being constituted by a bent portion of said strip extending transversely therefrom.

4,533,970

SERIES CURRENT LIMITER

Leland T. Brown, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 27, 1983, Ser. No. 507,654
Int. Cl.³ H02H *3/08, 3/087*
U.S. Cl. 361—58 **7 Claims**



1. A series current limiter circuit having a first terminal and a second terminal, comprising:

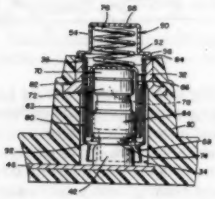
a first field effect transistor having a first current carrying electrode coupled to the first terminal and a second current carrying electrode coupled to a node, and a control electrode coupled to the second terminal; a second field effect transistor having a first current carrying electrode coupled to the node and a second current carrying electrode coupled to the second terminal; a first resistor coupled between the node and the control electrode of the first field effect transistor; a second resistor coupled between the node and a control electrode of the second field effect transistor; a third resistor coupled between the first terminal and the control electrode of the second field effect transistor; and means for clamping a voltage coupled between the second terminal and the control electrode of the second field effect transistor.

4,533,971

SHORTING CAGE FOR PROTECTOR WELLS

Thomas J. Smith, Bay Shore, N.Y., assignor to TII Industries, Inc., Copiague, N.Y.

Filed May 16, 1983, Ser. No. 495,102
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ H02H *3/22*
U.S. Cl. 361—119 **12 Claims**



1. An overvoltage surge arrester apparatus for protecting communication lines and equipment connected thereto from voltage surges comprising:

(a) a housing of insulating material having at least one well-type aperture disposed therein, said well-type aperture being provided with a first electrode adapted to be connected to earth ground and disposed at the closed end thereof having an upwardly extending portion and a second electrode disposed about the periphery of the open end of said well-type aperture, said second electrode being adapted to be connected to one of said communication lines;

(b) a hollow, electrically conductive shorting cage adapted to be received into said well-type aperture, said shorting cage being in continuous intimate electrical contact with said second electrode and having at least one inwardly extending finger portion adapted to be in electrically conductive contact with said upwardly extending portion of said first electrode; and

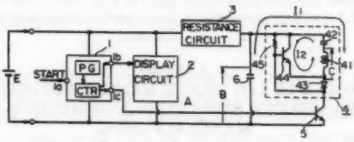
(c) a protector cartridge including an electrically conductive shell adapted to be received into said hollow shorting cage and be in electrically conductive contact at the upper portion thereof providing electrically conductive contact with a protective device disposed within said shell, one terminal of said protective device extending downwardly beyond said shell and being adapted to be in electrical contact with said upwardly extending portion of said first electrode when in position in said shorting cage, said protective device urging said protector cartridge shell to displace the inwardly extending finger portion of said shorting cage causing it to be out of electrically conductive contact with said upwardly extending portion of said first electrode when in position in said well-type aperture.

4,533,972

ELECTRONIC SWITCHING DEVICE HAVING REDUCED POWER CONSUMPTION

Takeo Ohashi, Suita, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 11, 1983, Ser. No. 457,188
Claims priority, application Japan, Jan. 13, 1982, 57-4172
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—156 **9 Claims**



1. An electronic switching device including a self-latching electromagnetic switch for switching a load connected to the switch, which comprises

a self-latching relay circuit including an exciting coil,

first switching means connected in series with said relay circuit for controlling an electric current applied to the same,

current regulating means interposed between a power source and said relay circuit,

a first capacitor connected across said relay circuit and said first switching means which are connected in series so as to be charged by said power source to a steady state value through said current regulating means within a predetermined time period,

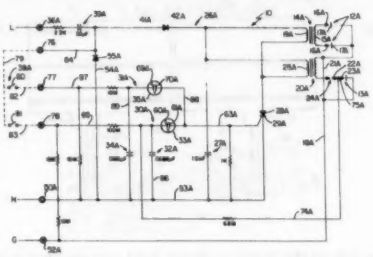
a signal generating means for generating an output signal which is applied to said first switching means as a controlling signal thereto, said controlling signal causing said first switching means to initiate a discharge of said first capacitor to produce a current in said exciting coil in a first direction, and,

means for causing a discharge of current from said first capacitor to produce a current in said exciting coil in a second direction opposite to the first.

4,533,973
ELECTRICAL CIRCUIT FOR A COOKING APPARATUS AND METHOD OF MAKING THE SAME

Steven A. Kimmel, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 24, 1984, Ser. No. 583,334
Int. Cl.[3] F23Q *3/00*
U.S. Cl. 361—253 10 Claims

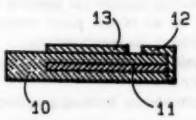


1. In an electrical circuit means for a cooking apparatus, said circuit means being adapted to cause sparking at first igniter means for top burner means of said apparatus by causing current flow through the primary of a first transformer and to cause sparking at second igniter means for oven burner means to said apparatus by causing current flow through the primary of a second transformer, said circuit means having a main circuit branch having opposed ends and being adapted to be interconnected to an electrical power source at said opposed ends thereof so as to charge a main capacitor that causes said current flow through said primaries when a gate of an SCR of said main branch is activated, said circuit means having two activating circuit branches each being adapted to activate said gate, each activating branch having a neon bulb and a capacitor which causes its respective neon bulb to fire and activate said gate when its respective capacitor is charged to a value that reaches the breakover voltage of its respective neon bulb, one of said activating branches causing spark quenching when a flame appears at said second igniter means, the improvement comprising a switching means in said circuit means that is interconnected to said main circuit branch intermediate said opposed ends thereof and is adapted to selectively electrically interconnect each activating branch to said main branch and thereby activate the interconnected activating branch so as to cause sparking at said igniter means.

4,533,974
LOW-FIRING HIGH Q MONOLITHIC CERAMIC CAPACITOR

Galeb H. Maher, North Adams, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Apr. 9, 1984, Ser. No. 597,907
Int. Cl.[3] H01G *4/12*
U.S. Cl. 361—320 8 Claims



1. A monolithic ceramic capacitor having a Q of at least 5000 at 1 MHz comprising a dense mature ceramic body and at least one sheet electrode buried in said body, said at least one electrode extending to one body face, said body having been co-fired with said buried electrode; said body being comprised of from 92–98 weight percent of a high firing ceramic composition and from 8–2 weight percent of a low firing borate flux, said high firing ceramic composition consisting essentially of 90 to 95 weight percent of a magnesium zinc titanate and 10 to 5 weight percent calcium titanate.

4,533,975
RADIATION HARDENABLE COATING AND ELECTRONIC COMPONENTS COATED THEREWITH

Jacob C. Bill, Columbia, S.C., assignor to North American Philips Corporation, New York, N.Y.

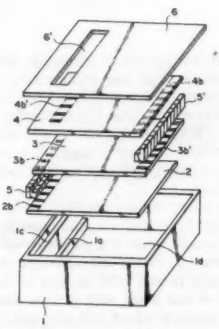
Filed Dec. 27, 1983, Ser. No. 565,685
Int. Cl.[3] H01G *4/08, 4/18;* C08F *2/46;* B05D *1/00*
U.S. Cl. 361—323 7 Claims

1. An ultraviolet radiation curable liquid coating composition particularly adapted for providing a low temperature degradable electronic component with a protective coating, said composition comprising a liquid mixture of an acrylated epoxy oligomer, an acrylated urethane oligomer, a hydroxyalkyl methacrylate monomer, an aliphatic bicyclic monofunctional monomer, a calcined cobalt alumina pigment and at least one U.V. free radical initiator and one thermal free radical initiator.

4,533,976
ELECTRONIC UNIT

Kaname Suwa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,503
Claims priority, application Japan, Dec. 24, 1981, 56-208036
Int. Cl.[3] H05K *1/14*
U.S. Cl. 361—395 12 Claims



1. An electronic package containing circuit boards, said package comprising:

a plurality of printed circuit boards each having connecting patterns;

a casing having an opening for inserting said printed circuit boards;

conductive and elastic connecting means each disposed at the position corresponding to said connecting patterns between respective ones of said printed circuit boards and electrically connecting said printed circuit boards; and

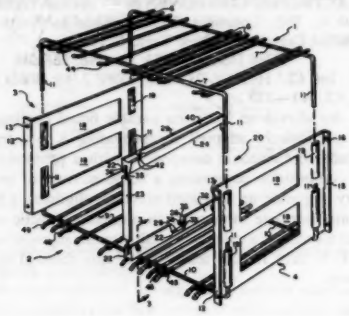
a cover for closing said opening of said casing to press said printed circuit boards in said casing to secure said printed circuit boards to said casing and electrically connect said printed circuit boards, and having a window portion at a position facing said connecting patterns for connection to an external piece of equipment.

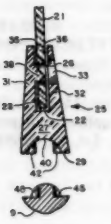
4,533,977

PRINTED WIRING BOARD ASSEMBLY EMPLOYING TRACK ENGAGING RUNNERS

James V. Koppensteiner, Chicago, and John E. Kaczkos, Elk Grove Village, both of Ill., assignors to GTE Communication Systems Corporation, Northlake, Ill.

Filed May 17, 1984, Ser. No. 611,236
Int. Cl.[3] H05K 1/18
U.S. Cl. 361—415 10 Claims





1. A printed wiring board assembly including a printed wiring board and at least one guide runner attached thereto, said printed wiring board assembly adapted to be mounted in a printed wiring board file including a plurality of printed wiring board guide tracks and said guide runner comprising:

an elongated body of rigid construction including at least a first and a second lengthwise surface, said surfaces parallel to each other;

a pair of elongated walls extending from said body for the length of said body and perpendicular to said first surface, said walls spaced apart a predetermined distance forming there between a printed wiring board receiving channel;

a groove formed in said body second surface and extending the length of said body, said groove adapted to engage a respective guide track of said file; and

means for retaining said body to said board.

4,533,978

CIRCUIT BOARD STIFFENING

Leo Walter, Palos Verdes Estates, Calif., assignor to Bucklee-Mears Company, St. Paul, Minn.

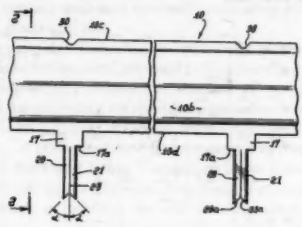
Filed Jun. 6, 1983, Ser. No. 499,209
Int. Cl.[3] H05K 1/18
U.S. Cl. 361—419 7 Claims

1. In a circuit board stiffener, the combination comprising

(a) an elongated stiffening member adapted to extend over the board surface and spaced therefrom,

(b) projections integral with said member and having surfaces adapted to engage one side of the board, and

(c) bendable retainer means carried by said member to retain said member to one side of the board, said retainer means comprising pairs of arms, the arms of each pair extending in closely spaced, parallel, side-by-side relation so as to project from a position within an opening through the board and beyond the opposite side of the board to a position to be quickly spread apart and bent away from one another to engage said opposite side of the board or solder thereon and to pull the contact surfaces against said



one side of the board to firmly hold said member in position,

(d) said arms having terminals which are angled to receive and be spreadable by a spreading tool, and

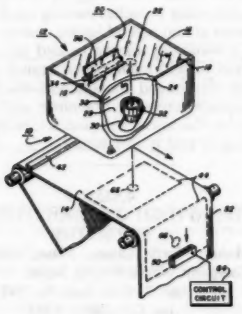
(e) there being a split between said arms, the split extending from said terminals into proximity to one of said projection surfaces.

4,533,979

FULL-FRAME FLASH ILLUMINATION SYSTEM

James D. Rees, Pittsford; Robert W. Gundlach, Victor, and Jerome E. May, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 8, 1984, Ser. No. 608,300
Int. Cl.[3] G09F 13/04
U.S. Cl. 362—97 5 Claims



1. A flash illumination and optical imaging system for reproducing documents on an object plane onto a photoreceptor belt member comprising, in combination,

a transparent object plane for supporting original documents to be reproduced,

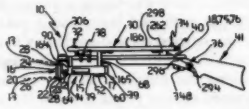
an document illumination housing positioned adjacent said object plane,

a first illumination means positioned interior of said housing and adapted to be periodically pulsed to provide a generally uniform level of illumination at said object plane,

a projection lens mounted in the bottom surface of said housing opposite said object plane, said lens adapted to project an image of said document onto said photosensitive belt member, said projected image containing a superimposed image of the projection lens as reflected from said object plane, and

a second illumination means adapted to irradiate an area of said belt conforming to the area of said negative lens image.

4,533,980
LUMINOUS GUN SIGHTING SYSTEM
Lawrence S. Hayes, 263 Gates St., Andover, Ohio 44003
Filed Jun. 21, 1982, Ser. No. 390,691
Int. Cl.³ F41G *1/34*
U.S. Cl. 362—110 **18 Claims**



1. An apparatus for use on a rifle or shotgun for hunting prey at night in the absence of natural light, comprising:

(a) a source of light mounted to said rifle, said source emitting a beam of light having a diverse path such that said light beam is dispersed over a region in front of said firearm;

(b) a filter pivotally mounted to said light source and movable into and out of said beam path, said filter being operative to filter said light beam when in said beam path so that light in a spectrum substantially invisible to the prey being hunted is emitted over said region;

(c) actuation means for abruptly moving said filter out of said beam path to allow broad spectrum illumination of said region in front of said firearm, when desired;

(d) front and rear illuminated gun sights comprising a front gun sight defining front sighting structure illuminated from within by an integral light source and a rear gun sight defining rear sighting structure illuminated from within by an integral light source;

(e) means for adjusting the illumination intensity of at least one of said front and rear gun sights.

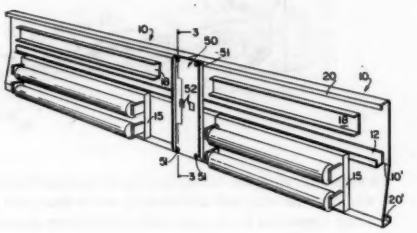
4,533,981
LIGHT CORNICE
John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.
Filed Aug. 16, 1982, Ser. No. 408,609
Int. Cl.³ F21S *1/02*
U.S. Cl. 362—151 **2 Claims**

1. An interior vertically extensible knockdown cornice construction for illuminating a retail store wall or the like, comprising

(a) a horizontally extending panel of rigid sheet material disposed in a substantially vertical plane forwardly of said wall having front and rear faces, with a lighting fixture mounted on the rear face,

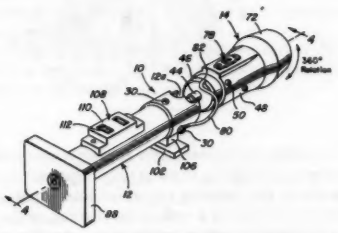
(b) said panel having a horizontal integral channel member of substantially rectangular cross-section extending rearwardly from the plane of the vertical panel at the top thereof and terminating in a downwardly extending flange spaced from the rear face of said panel and a second integral parallel channel member of substantially rectangular cross-section at the bottom of the panel extending forwardly from the front face thereof and terminating in an upwardly extending flange spaced from said panel,

(c) a depending second panel suspended from said first panel, substantially similar to the latter, having the rearwardly extending rectangular channel member at the top thereof nested closely within the forwardly extending rectangular channel at the bottom of said first panel for interengagement therewith and forming a substantially rigid joint therebetween, and



(d) pointed threaded screw fasteners adapted to penetrate the readily accessible rear face of the first-mentioned panel and channel member along the bottom edge thereof for driving the pointed ends thereof into engagement with the downwardly extending flange of the channel nested therein, to clamp the second panel securely to said first panel.

4,533,982
FLASHLIGHT WITH SWIVELLING HEAD
John J. Kozar, 11 St. - 5th Ave., New Kensington, Pa. 15068
Filed Oct. 22, 1984, Ser. No. 663,174
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—183 **18 Claims**



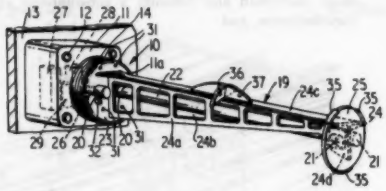
1. A portable flashlight comprising a battery casing, a flashlight head with a light bulb, lens and reflector assembly, and an electrically conducting ball-and-socket assembly forming a swivel connection between the battery casing and the head and also providing electrical connection between the battery casing and the head as part of an electrical circuit for connecting a battery in the casing with the light bulb.

4,533,983
LIGHTING FIXTURES WITH BEAM SUPPORT AND OPPOSITE END CONTACT MEANS
Bjorn Hafstad, Flåten, N-5200, Norway
Filed Sep. 20, 1982, Ser. No. 419,914
Claims priority, application Norway, Sep. 21, 1981, 813193
Int. Cl.³ F21V *15/00*
U.S. Cl. 362—223 **11 Claims**

1. A lighting fixture comprising

a base member adapted to be secured to a permanent support;

a holder for supporting a lamp device, said holder including a rigid self-supporting support beam fastened at one end to said base member and projecting outwardly from said base member;



a transparent elongate casing having an open end secured to said base member and surrounding said holder, said casing being supported on an outer end of said beam spaced from said base member; and

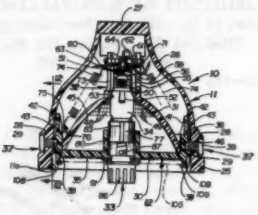
contact means at opposite ends of said holder for a lamp device.

4,533,984

VARIABLE-WIDTH-BEAM LIGHT APPARATUS

James W. Gatton, P.O. Box 27/ St. Rte. 97 E., Bellville, Ohio 44813

Filed Sep. 7, 1982, Ser. No. 414,973
Int. Cl.³ F21V *21/14;* F21L *15/20;* F21S *5/00*
U.S. Cl. 362—232 **17 Claims**



1. A variable-width-beam light apparatus comprising

(A) a support housing adapted to be mounted on a support structure, said housing having an interior cavity and an aperture formed in a wall of the housing, and

(B) a light-emitting lamp and reflector assembly mounted in said housing cavity to emit a beam of light through said housing aperture, said assembly including

(1) mounting means mechanically interengageable with said housing for securing of said assembly in said housing,

(2) an electrically energized lamp,

(3) an optical reflector having a reflecting surface configured to reflect light emitted from said lamp in a relatively forward direction along a longitudinal axis of said reflector that extends through a focal point of the reflecting surface as a beam of light having a width determined by the position of said lamp with respect to the focal point when disposed on the longitudinal axis of the reflector,

(4) a lens supported on said optical reflector in relatively forward relationship to the focal point of said reflector along the longitudinal axis of the reflector for transmission of the reflected light therethrough,

(5) lamp positioning means for positioning of said lamp at a selected position along the longitudinal axis of said reflector including

(a) lamp supporting means mounted on said reflector having a lamp carrier supported for reciprocating displacement along a path disposed in parallel relationship to the longitudinal axis of said reflector and biasing means mechanically coupled with said lamp carrier to bias said carrier toward said lens, said lamp carrier adapted to receive and support said lamp on said longitudinal axis for reciprocating movement along said axis, and

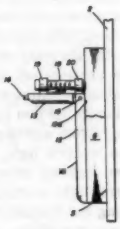
(b) lamp displacing means mounted on said lens and cooperatively engageable with said lamp carried by said lamp carrier, said lamp displacing means including a guideway mounted on said lens in fixed relationship thereto, a lamp displacing element that contactingly engages with said lamp that is carried by said lamp carrier, carried by said guideway in cooperative engagement therewith for axial reciprocation relative thereto along the longitudinal axis of said reflector and restrained against rotation about the longitudinal axis and an actuator carried by said lens and mechanically coupled with said lamp displacing element and selectively operable to effect axial reciprocation of said lamp displacing element to effect reciprocation of said lamp, said lamp displacing means selectively operable to effect and control displacement of said lamp along the longitudinal axis of said reflector to a selected position.

4,533,985

ILLUMINATING DEVICE WITH MERCURY SWITCH AND ADJUSTABLE ABUTMENT TAB

Joseph J. Jasinski, Box 439, R. R. 11, Cumming, Ga. 30130

Filed Jul. 26, 1984, Ser. No. 634,611
Int. Cl.³ F21V *19/02*
U.S. Cl. 362—276 **4 Claims**



1. An illuminating device comprising a housing, said housing comprising a back panel, side walls joined respectively to the side edges of said back panel and upstanding therefrom, and a front panel joined to the edges of at least some of said side walls remote from said back panel, an energy source disposed in said bearing, a light disposed in said housing, conductor means adapted to provide a circuit between said energy source and said light, a mercury switch operably interconnected with said conductor means, said front panel comprising a pair of shoulders, said illumination platform comprising an abutment tab disposed along the lower portion thereof, said illumination platform being pivotally connected to said front panel between said shoulders and the adjacent portions of said abutment tab, said illumination platform being adapted to swing outwardly of said housing through an arc of approximately 90°, said abutment tab of said illumination platform being disposed in a complementary relationship with corresponding portions of said front panel when said illumination platform and said front panel are in alignment, said front panel comprising an abutment edge disposed along the upper edge thereof between said shoulders, and a portion of the outer surface of said illumination platform being disposed in abutment with a portion of said

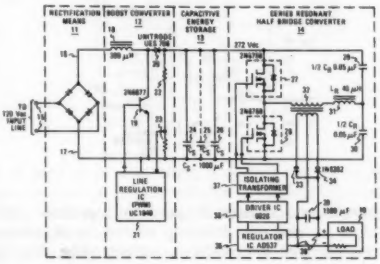
abutment edge when said illumination platform is swung fully outwardly.

4,533,986

COMPACT ELECTRICAL POWER SUPPLY FOR SIGNAL PROCESSING APPLICATIONS

Dwight V. Jones, Baldwinsville, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,376
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—17 **9 Claims**



1. In a power supply, the combination comprising:

A. a dc source having a common and non-common output terminal;

B. a voltage regulated, series resonant half bridge converter having a pair of dc input terminal coupled respectively to said common and said non-common output terminal, and a pair of output terminals for connection to supply energy at a regulated voltage thereto, said half bridge converter comprising:

(1) a first and a second solid state switch, each having a pair of principal electrodes and a control electrode, said first and second solid state switches being serially connected via the principal electrodes thereof between said terminals of said source,

(2) an output transformer having a primary winding and a secondary winding, alternating conduction of said first and second solid state switches connecting one end of said primary winding alternatively to said common and said last recited non-common source terminal to produce an ac input to said primary winding and inducing an ac output in said secondary winding,

(3) means coupled between said secondary winding and said output terminals for rectifying said transformer ac output and producing a dc output voltage at said converter output terminals,

(4) series resonant circuitry including an inductive element and one capacitive element connecting in shunt and at least one capacitive element connected in series with said primary winding, and

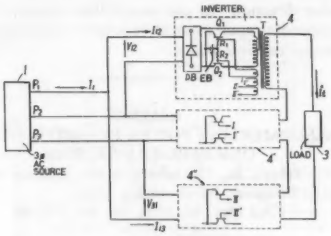
(5) regulating means responsive to said rectified dc output voltage, coupled to the control electrodes of said first and second solid state switches for causing alternate conduction thereof, controlled to achieve output voltage regulation by adjustment of the switching rates of said first and second switches in relation to the resonance frequency of said resonant circuitry.

4,533,987

POWER SUPPLY SYSTEM

Yoshiaki Tomofuji, Osaka, and Takayoshi Maeda, Hirakata, both of Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Nov. 9, 1982, Ser. No. 440,425
Claims priority, application Japan, Nov. 11, 1981, 56-180679
Int. Cl.³ H02M *5/453*
U.S. Cl. 363—36 **2 Claims**



1. A power supply system comprising:

a source providing three phase AC power at a predetermined frequency, said source having output lines respectively corresponding to each of the phases of said AC power;

a plurality of rectifiers connected to respective pairs of said output lines;

a plurality of inverters each connected to an output of a respective one of said rectifiers and comprising an oscillation circuit, each said inverter providing by means of said oscillation circuit an oscillating output signal at a predetermined higher frequency than said predetermined frequency, the output signals of all of said inverters being at the same predetermined higher frequency;

a control means for operating the oscillation circuits of said inverters, said control means synchronizing the oscillation period of the oscillation circuits of the inverters such that the output signals of said inverters have the same zero cross point timing;

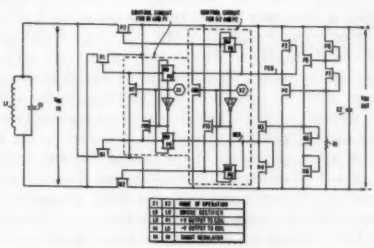
means connected to the outputs of said inverters for superposing in series and phase the outputs of said inverters to produce a high frequency power source.

4,533,988

ON-CHIP CMOS BRIDGE CIRCUIT

Christopher N. Daly, Bilgola Plateau, and David K. Money, Pennant Hills, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Apr. 9, 1981, Ser. No. 252,313
Int. Cl.³ H02M *7/797*
U.S. Cl. 363—127 **42 Claims**



1. A bridge circuit comprising energy storage means; energy receiver means; two pairs of complementary field-effect tran-

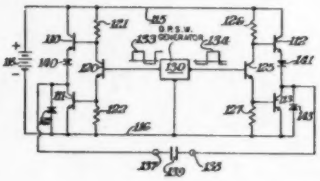
sistors arranged in a bridge configuration between said energy receiver means and said energy storage means; and means for biasing the gates of all of said field-effect transistors such that when the voltage across said energy receiver means is less than the voltage across said energy storage means each of said transistors conducts a low quiescent current in one direction, and when the voltage across said energy receiver means is greater than the voltage across said energy storage means the transistors in one of said two pairs conduct higher currents in the other direction, the pair which thus conduct higher currents depending upon the relative polarity of the voltage across said energy receiver means.

4,533,989

TRANSFORMERLESS POWER INVERTER WITH ONLY ONE TYPE TRANSISTORS

John R. Hebert, Jr., Clarksburg, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 10, 1980, Ser. No. 129,048
Int. Cl.[3] H02M 7/537
U.S. Cl. 363—132 1 Claim



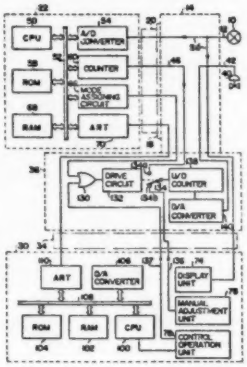
1. A transformerless inverter comprising: (a) four NPN power transistors connected to form a bridge circuit having four circuit nodes; (b) one DC power buss being connected to a first of said nodes; (c) another DC power buss being connected to a second of said nodes that is opposite said first node, a first and second of said bridge-connected transistors being series connected respectively emitter to collector at the fourth of said nodes that is opposite said third node, the collectors of said first and third bridge-connected transistors being connected to said first node; (d) two commutating circuits each comprising an NPN commutating transistor, a collector resistor connected between the collector of said commutating transistor and said first node, and an emitter resistor being connected between the emitter of said commutating transistor and said second node, the collector and emitter of one of said commutating transistors being connected to the bases of said first and second bridge-connected transistors, respectively, the collector and emitter of the other of said commutating transistors being connected to the bases of said third and fourth bridge-connected transistors, respectively; (e) a square wave generating means for producing two periodic square wave signals at the bases of said two commutating transistors, respectively, which signals are 180° out of phase with each other and which signals periodically turn on and turn off said commutating transistors; (f) a first pair of diodes each being connected anode to cathode in parallel respectively with one of said second and fourth bridge-connected transistors emitter to collector; (g) each of a second pair of diodes having an anode connected to an emitter of one of said first and third bridge-connected transistors, said second pair diodes forming the connection between said first and third transistors and said third and fourth nodes, respectively; (h) a pair of load terminals that are connected to said third and fourth nodes, respectively; and (i) a capacitive load connected across said load terminals so that there is impressed upon said capacitive load a square wave voltage having equal amplitude positive and negative excursions.

4,533,990

COMPUTER PROCESS CONTROL SYSTEM

Keisuke Takada, and Hiroo Okuhara, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 8, 1982, Ser. No. 415,799
Claims priority, application Japan, Oct. 18, 1981, 56-166262
Int. Cl.[3] G06F 15/46
U.S. Cl. 364—160 14 Claims



1. A process control system for performing process control connected to at least one detecting section for detecting a process variable and generating a corresponding detection signal and to at least one actuator section for changing the process status, said process control system comprising:

at least one microcomputer controlling means, housed in a first case member, for comparing the process variable with a preset target value in response to the detection signal and for subjecting a difference between the process variable and the preset target value, if any, to predetermined operations to produce a first electrical signal for minimizing the difference in a first operation mode;

man-machine interface means, disposed in a second case member and connected to a connector through a first cable extending from said second case member to outside said second case member, for displaying the process variable and the preset target value in response to the detection signal and for allowing an operator to manually adjust a second electrical signal for minimizing the difference in a second operation mode, said second electrical signal being transmitted through said first cable to outside said process control system;

output means, housed in a third case member which has a first surface with a receptacle detachably engaging with said connector of said man-machine interface means and a second surface, for receiving the first and second electrical signals and for selecting and holding one of the first and second electrical signals as an operation signal in accordance with one of the first and second operation modes, said second surface having a signal terminal which is exposed and which electrically transmits the operation signal to outside said process control system; and

signal relaying means, having a connection panel to which at least said detecting section, said actuator section and said signal terminal of said output means are detachably connected, for transmitting the detection signal to said microcomputer controlling means and said man-machine interface means and for transmitting the operation signal from said output means to said actuator section connected to said connection panel, said signal relaying means, when another controlling means is provided for another control loop, performing its signal transmission operation also for said another controlling means.

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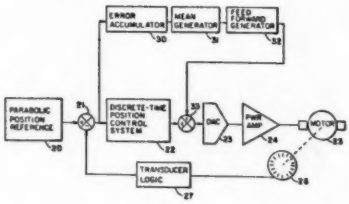
4,533,991

ADAPTIVE FEEDFORWARD SERVO SYSTEM

Steven P. Georgis, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Dec. 29, 1982, Ser. No. 454,226
Int. Cl.³ G06F 15/46
U.S. Cl. 364—164 11 Claims



1. A method of controlling a desired parameter, such as angular position or angular velocity, of a movable body such as a motor shaft, during a mode of acceleration or deceleration comprising the steps of:

(a) generating, for the selected mode of operation, a first signal for controlling the movement of said movable body during said selected mode of operation;

(b) applying said first signal to drive means coupled to said movable body to accomplish said selected mode of operation;

(c) generating a plurality of reference values representing the desired value of a selected parameter associated with said movable body, such as angular position or velocity, at predetermined time periods during said selected mode of operation;

(d) measuring, at each of said predetermined time periods during said selected mode of operation, the actual value of said parameter associated with said movable body;

(e) comparing said actual parameter value to said desired parameter value at each of said predetermined time periods and generating a digital parameter error signal representing the difference between said two values at each of said predetermined times;

(f) dividing said digital parameter error signal by a first fixed number having a value of at least two, whereby the sensitivity of a least significant bit within said digital parameter error signal to noise is reduced;

(g) summing the divided digital parameter error signals generated in step (f) over a prescribed number of said predetermined time periods to form an error sum signal;

(h) dividing the error sum signal of step (g) by a second number to generate an adaptive error signal, the product of said first and second numbers being greater than the prescribed number of time periods over which said error signals are summed in step (g);

(i) applying said adaptive error signal generated in step (h) to said first signal generated in step (a) to correct for the average parameter error, as determined in steps (e)–(h), during said selected mode of operation; and

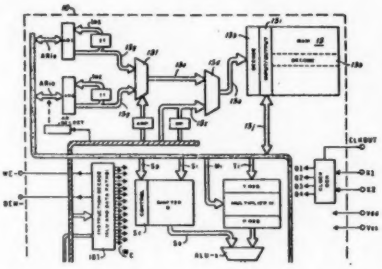
(j) repeating steps (c)–(i) as needed throughout said selected mode of operation so as to regularly update said first signal with the latest average parameter error information associated with said selected mode of operation.

4,533,992

MICROCOMPUTER HAVING SHIFTER IN ALU INPUT

Surendar S. Magar, and Edward R. Caudel, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,959
Int. Cl.³ G06F 7/38
U.S. Cl. 364—200 5 Claims



1. A microcomputer device constructed in a single integrated circuit comprising:

(a) an arithmetic/logic unit having at least one data input of 2N bits and a data output of 2N bits, where N is an integer,

(b) data bus means of N bits in width,

(c) shifter means connecting the data bus means to said one data input of the arithmetic/logic unit; the shifter means having an N-bit input coupled to said data bus means and a 2N-bit output coupled to said one data input of the arithmetic/logic unit;

the shifter means selectively shifting a data word received at said N-bit input from zero bits up to N−1 bits and applying the shifted data word to said one data input of the arithmetic/logic unit,

said shifter means extending the most significant bit of the data word to fill all bits between said most significant bit of the shifted data word and the most significant of said 2N bits of said one data input of the arithmetic/logic unit.

4,533,993

MULTIPLE PROCESSING CELL DIGITAL DATA PROCESSOR

John V. McCanny, and John G. McWhirter, both of Malvern, England, assignors to National Research Development Corp., London, England

Filed Aug. 10, 1982, Ser. No. 406,916
Claims priority, application United Kingdom, Aug. 18, 1981, 8125222
Int. Cl.³ G06F 7/00
U.S. Cl. 364—200 15 Claims

1. A processing system including at least one digital data processor for carrying out a given calculation said at least one digital data processor including:

(1) a two-dimensional array of bit-level processing cells each arranged to perform a twos complement multiplication operation upon input bits to produce output bits, at least some of the cells being arranged such that one of the input bits to be multiplied is complemented or uncomplemented according to the value of an input control bit;

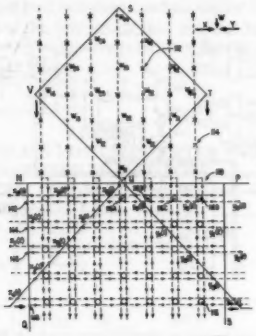
(2) a plurality of storing means associated with each processing cell, each storing means being arranged exclusively for receipt and subsequent output of successive bits from a respective cell output in response solely to clock signal activation and delaying successive bits appropriately to cascade array logic operations;

(3) cell interconnection lines arranged in a scheme appropri-

BEST COPY AVAILABLE

ate for the multiplication and providing cell output bit routes from respective storing means to neighboring cells, the said scheme providing successive predetermined inter-cell paths both for bits input to the array and for cascading array logic operations;

(4) digital data input means responsive to clock signal activation to provide the array with a predetermined flow of input bits appropriate for the multiplication;



(5) clocking means for sole control of calculation execution, the clocking means being arranged to generate clock signals timed to activate the digital data input means and storing means repetitively as appropriate to cascade array logic operations; and

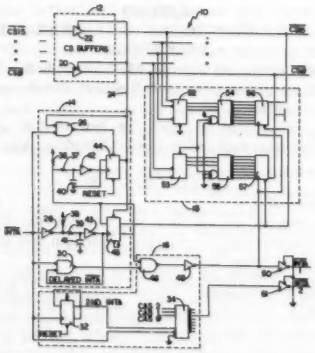
(6) output lines for receiving respective calculation result bits, the output lines being connected to respective processing cell outputs each appropriate to provide output bits resulting from arithmetic logic operations cascaded through the array.

4,533,994

PRIORITY CIRCUIT FOR A MULTIPLEXER TERMINAL

Roy L. Harrill, and James T. Odom, both of Huntsville, Ala., assignors to Avco Corporation, Huntsville, Ala.

Filed Sep. 9, 1983, Ser. No. 530,707
Int. Cl.[3] G06F 9/46
U.S. Cl. 364—200 **5 Claims**



1. Priority selecting apparatus for a data multiplexer terminal having in combination a multiplicity of input/output devices each including a logic card connected by a signal line to the multiplexer terminal, a central processor unit capable of generating dual pulse interrupt acknowledge commands at the end of each service cycle, a main memory for storage of data and system busses for connecting all units into an operating whole, wherein the interrupt request and grant signals are time multiplexed across the bussed address signal lines, said priority selecting apparatus comprising:

a card select buffer section, one such buffer serially inserted in each of said signal lines, each buffer being a two state device, in one state enabling passage of data bytes from the input to the output, in its second state blocking transfer of data bytes from the input to the output;

a priority decoder for selecting during each interrupt the binary value of the input/output line having the highest priority of all devices requesting service, said priority decoder being encircuited at the output end of said card select buffers;

signal generator means responsive to the dual pulse interrupt acknowledge command from the central processor unit, said generator producing output signals which maintain all buffers in a disabled state for the duration of the entire interrupt command, then after disabling the buffers activating the priority decoder signalling said decoder to determine which input/output line is to be serviced during the next data cycle, said generator further producing during the second part of said dual pulse interrupt command time interval, an enabling latch signal for the logic card associated with the highest priority line determination, said signal generator returning to a neutral status at the end of said dual pulse interrupt acknowledge command, thereby re-enabling said card select buffers; and

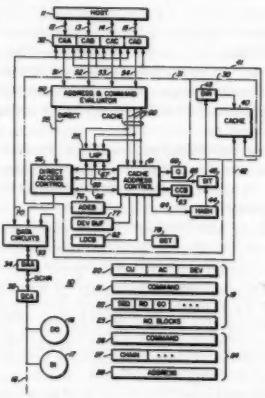
circuit means within each logic card for signifying to the central processor unit the memory location where pertinent data is to be found for servicing the input/output line determined to have highest priority.

4,533,995

METHOD AND SYSTEM FOR HANDLING SEQUENTIAL DATA IN A HIERARCHICAL STORE

John H. Christian; Michael H. Hartung; Arthur H. Nolta; David G. Reed; Richard E. Rieck, and John S. William, all of Pima County, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,632
Int. Cl.[3] G06F 13/00
U.S. Cl. 364—200 **14 Claims**



1. A storage system having connection means connected to a host processor and having a high-speed data cache and a slow-speed backing store connected to said connection means, transferring means connected to said connection means and to said cache and backing store for transferring data between said

cache and backing store, said cache and backing store each having a plurality of addressable data storage registers;

the improvement comprising:

first means coupled to said connection means for receiving from said connection means and storing an intent signal identifying an address of said data storage registers in the backing store for identifying predetermined sequential ones of said data blocks and limit means in the first means for indicating the numerical extent of such data blocks up to a predetermined maximum number of such data blocks to be transferred between said backing store and said cache in a single data transfer operation;

read means in said transferring means and connected to said connection means and to said cache for transferring data, as a peripheral data storage operation, to said connection means from said cache and for storing backing store addresses indicating which of said sequential blocks of signals identified by said stored intent signal were sent to the connection means; and

second means connected to said connection means for receiving read peripheral commands supplied by said host processor, connected to said transfer means and connected to said first means for being responsive to said stored intent signal and a read peripheral command received from said connection means for any one of said identified predetermined sequential data blocks to activate said transfer means to transfer, as a peripheral data storage operation, from said backing store to said cache, all of the said sequential data blocks identified by said received intent signal beginning with said any one of said identified sequential data blocks plus successive ones of said identified data blocks up to said predetermined maximum number of the data blocks and only including those data blocks stored in said backing store indicated by said received intent signal.

4,533,996

PERIPHERAL SYSTEMS ACCOMMODATION OF GUEST OPERATING SYSTEMS

Michael H. Hartung, Pima County, Ariz., and Kenneth P. Nolan, Boulder County, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1982, Ser. No. 351,558

Int. Cl.³ G06F *4/00*

U.S. Cl. 364—200 **2 Claims**

1. A peripheral data handling system attachable to a host processor supporting a host operating system and a plurality of guest operating systems (guests), means in said host processor for sending peripheral commands including data storage location addresses to said peripheral data handling system for performing peripheral operations in accordance with said commands wherein said commands supplied by said guests including guest peripheral commands having virtual addresses, and wherein said commands supplied by the said host operating system includes host peripheral commands having real addresses;

the improvement including in combination:

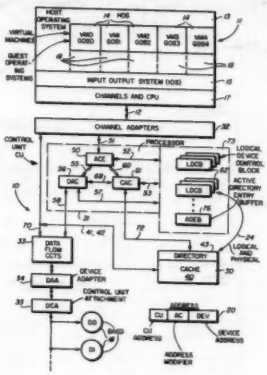
attachment means for being coupled to said host processor for receiving said peripheral commands;

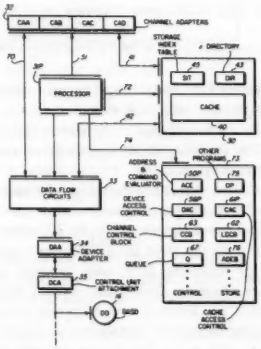
control means in said peripheral data handling system connected to said attachment means for receiving from said host processor a signal indicating that a given chain of commands is sourced from a said guest or said host operating system;

first means connected to said control means and to said attachment means for being responsive to said received ones of said peripheral commands indicated by said signal as being received from said host operating system to translate said received host peripheral commands and execute same in the peripheral data handling system in accordance with the respective command indicators of said peripheral command; and

second means connected to said control means and to said attachment means for being responsive to said received ones of said peripheral commands indicated by said signal as being received from a one of said guests to translate said received guest peripheral commands and execute same in said peripheral data handling system in accordance with the respective command indicators in said received ones of said guest peripheral commands and with said signal such that the extent of command execution is adjusted by said peripheral system by first modifying the respective command indicators by said signal and then executing the respective guest peripheral command to accommodate characteristics of said guest within said host processor;

a buffer connected to said attachment means, said control means, said first means, and said second means for storing data and having a plurality of addressable data storage locations and means for addressing said storage locations;





a plurality of peripheral devices attached to said buffer for transferring data therewith and having a plurality of addressable data storage locations wherein each said received guest peripheral command includes a predetermined data storage address location of a one of said plurality of peripheral devices;

said second means being responsive to a said received guest peripheral command from a guest for accessing said storage locations in said buffer and said peripheral devices by modifying the virtual address signals received with said guest peripheral command from a virtual address to a real address by using the respective said predetermined data storage address for the one peripheral device; and

said first means having addressing means responsive to said real address received with said host peripheral commands

for addressing said storage locations and said peripheral devices in accordance with said received real addresses.

4,533,997

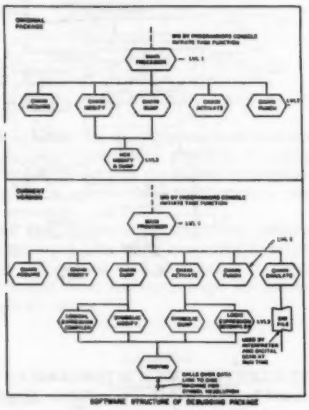
COMPUTER MONITORED OR CONTROLLED SYSTEM WHICH MAY BE MODIFIED AND DE-BUGGED ON-LINE BY ONE NOT SKILLED IN COMPUTER PROGRAMMING

Donald F. Furgerson, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 283,653, Aug. 25, 1972, abandoned. This application Jan. 17, 1980, Ser. No. 112,972

Int. Cl.[3] **G06F** *11/00*

U.S. Cl. 364—200 **7 Claims**



SOFTWARE STRUCTURE OF DEBUGGING PACKAGE

1. A system for controlling the operation of devices in an industrial process, said system including:

a process control digital computer system having a memory;

means for applying input signals from said devices to said computer system;

a plurality of algorithm-defining data sets within the memory of said computer system which specify how the states of some input signals are to be adjusted at least in accordance with the state of other input signals;

means for receiving from said memory and for operating display means to display any of said data sets to a human operator on demand, said receiving and operating means including means for translating said data sets into a terminology with which the human operator is familiar prior to display;

means controlled by a human operator for operating on a displayed data set including means for deleting portions of data sets and means for making additions to data sets so as to generate an edited data set for display and so as to establish or modify the operating configuration of the process devices when such data set is re-entered into said memory;

means for coupling edited and unedited displayed data sets to said memory, said coupling means including means for re-translating said data sets into a machine-executable language prior to storage: and

means for generating output signals to operate said devices as a function of the input signals and the data sets as established in said memory and edited from time to time.

4,533,998

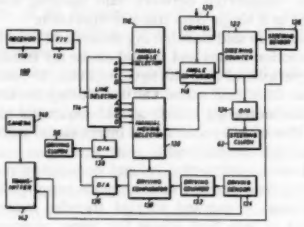
CONTROL APPARATUS FOR OMNIDIRECTIONAL, POLAR COORDINATED PLATFORM FOR LAWNMOWER AND THE LIKE

Reza Falamak, P.O. Box 770188, Houston, Tex. 77215

Continuation of Ser. No. 353,250, Mar. 1, 1982, Pat. No. 4,463,821. This application Jul. 6, 1984, Ser. No. 628,337

Int. Cl.[3] **G06F** *15/50;* **B62D** *1/28*

U.S. Cl. 364—424 **20 Claims**



11. A drivable, steerable platform having control apparatus, said platform comprising:

a frame member, said member being generally disposed in a frame member plane;

at least three wheel assemblies, each of said wheel assemblies including:

first support structure rotatably connected to said frame member such that said support structure rotates about an axis substantially perpendicular to said frame member plane, said first support structure being endlessly rotatable through an angle of 360°;

a wheel member rotably mounted on said first support structure such that said wheel member rotates in a wheel rotation plane about an axis substantially parallel to said frame member plane;

first drive structure to drive said wheel member about its axis of rotation in said wheel rotation plane; and

first steering structure to rotate said first support structure about its axis of rotation, whereby said wheel member is endlessly steerable through an angle of 360°;

a first endless device drivingly connected to each of said first drive structures to rotate each of said wheel members substantially in synchronism;

a second endless device drivingly connected to each of said first steering structures to rotate each of said first support structures substantially in synchronism; and

drive means for selectively driving said first and second endless devices, said means including:

a driving device;

first coupling structure to selectively couple and uncouple said driving device and said first endless device; and

second coupling structure to selectively couple and uncouple said driving device and said second endless device;

wherein the wheel rotation planes of said at least three wheel members are disposed substantially parallel to each other; and

said control apparatus comprising:

line selector means having at least one steering command line and at least one driving command

line for selectively activating at least one of said command lines;

manual angle selector means coupled to said at least one steering command line for outputting a steering angle signal;

compass means for producing a compass signal;

angle comparator means coupled to said manual angle selector means and to said compass means for receiving said

steering angle signal and said compass signal, and for selectively outputting a steering signal;

steering counter means coupled to said angle comparator means for receiving said steering signal, for outputting a steering counter signal, and for outputting a coordination signal;

first means coupled to said steering counter means for receiving said steering counter signal and for outputting an output steering signal;

steering sensor means for sensing the orientation of at least one of said wheel assemblies for

outputting a wheel orientation signal representative of said orientation, and for coupling said wheel orientation signal to said steering counter means;

manual moving selector means coupled to said at least one driving command line and to said steering counter means for receiving said coordination signal and for outputting a drive signal;

driving sensor means for sensing the distance traveled by at least one of said wheel members and for outputting a distance signal;

driving counter means coupled to said driving sensor means for receiving said distance signal and for outputting a distance traveled signal representative of the distance traveled by at least one of said wheel members;

driving comparator means coupled to said manual moving selector means and to said driving counter means for selectively receiving said drive signal, for receiving said distance traveled signal, and for outputting a driving comparator signal; and

second means coupled to said driving comparator means for receiving said driving comparator signal and for outputting an output driving signal.

4,533,999

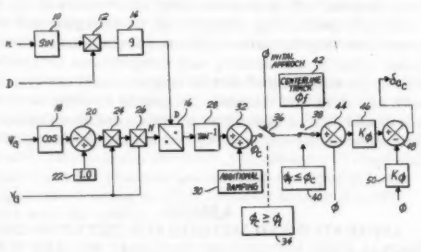
AIRCRAFT ROLL STEERING COMMAND SYSTEM

Antonius A. Lambregts, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 19, 1981, Ser. No. 294,274

Int. Cl.³ G05D *1/12*

U.S. Cl. 364—429 **10 Claims**



1. Apparatus for providing a roll steering signal ϕ_c to an aircraft on approach to the runway of a landing site wherein said landing site provides a Microwave Landing System (MLS) guidance signal, the apparatus comprising:

means for providing a signal V_G representative of the groundspeed of the aircraft;

means for providing a signal ψ_G representative of the groundtrack angle of the aircraft with respect to the centerline of the runway;

means for providing a signal g representative of the acceleration due to gravity;

means for providing a signal D representative of the range of the aircraft from the source of the MLS guidance signal;

means for providing a signal η representative of the azimuth angle of the aircraft from the source of the MLS guidance signal; and

processing means for predeterminedly processing said V_G, ψ_G, D and η signals to produce said roll steering command signal ϕ_c, said signal ϕ_c being provided to said aircraft for continuously controlling said aircraft to a constant radius turn for following a circular capture path toward the runway centerline.

4,534,000

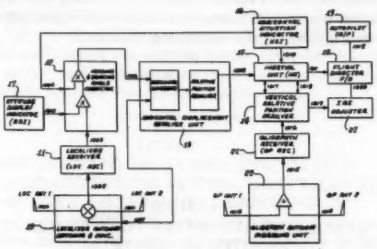
INERTIAL FLIGHT DIRECTOR SYSTEM

John H. Bliss, 2740 Graysby Ave., San Pedro, Calif. 90732

Continuation-in-part of Ser. No. 297,370, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 137,307, Apr. 4, 1980, abandoned, which is a continuation of Ser. No. 937,730, Aug. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 751,801, Dec. 17, 1976, Pat. No. 4,133,503, which is a continuation-in-part of Ser. No. 669,273, Mar. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 608,408, Aug. 29, 1975, Pat. No. 4,021,010. This application Feb. 15, 1984, Ser. No. 580,441

Int. Cl.³ G05D *1/12*; G06G *7/70*; B64C *13/18*

U.S. Cl. 364—428 **15 Claims**



1. In apparatus useful in controlling an aircraft flight path on the final approach to landing, there being a localizer beam transmitted rearwardly toward the aircraft from the landing area, and there being an inertially responsive unit on the aircraft, the combination comprising

(a) dual antennas carried on the aircraft and spaced apart laterally to receive said beam, and

(b) means responsive to the beam signals received by the two antennas to coact with said inertially responsive unit to produce an output for controlling banking of the aircraft so as to minimize deviation of the aircraft inertial flight path from a vertically and rearwardly extending plane at the center of said localizer beam.

4,534,001

NUMERICAL CONTROL SYSTEM

Ryoichiro Nozawa, Shibuya, and Nobuyuki Kiya, Hachioji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP82/00079, § 371 Date Nov. 15, 1982, § 102(e) Date Nov. 15, 1982, PCT Pub. No. WO82/03282, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 23, 1982, Ser. No. 444,574

Claims priority, application Japan, Mar. 23, 1981, 56-042195; Mar. 23, 1981, 56-042196

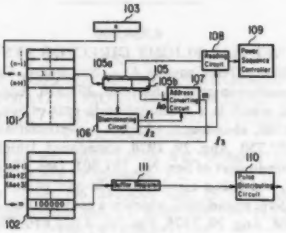
Int. Cl.³ G06F *15/46*; G05B *19/18*

U.S. Cl. 364—474 **7 Claims**

1. A numerical control system, comprising:

memory and controller means for storing a machining program, and including a memory from which machining commands which comprise the machining program are successively read out, and a controller for performing predetermined numerical control processing, where at least the machining commands concerning movements comprise alphabetic letters indicating moving directions and data numbers corresponding to memory locations for storing movement data equivalent to target positions or

movement values, and where said memory is sectioned into, at least, a command area for storing the machining commands, and a data area for storing the various movement data; and



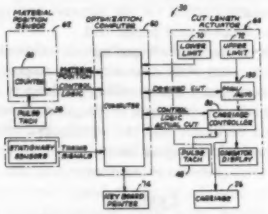
means for, when a predetermined machining command has been read out of the command area, reading out the movement data of the memory location corresponding to the data number of this machining command.

4,534,002

METHOD AND APPARATUS TO OPTIMIZE CUT LENGTHS OF MATERIAL

Robert G. Urban, Euclid, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 19, 1983, Ser. No. 459,181
Int. Cl.[3] G06F *15/46*
U.S. Cl. 364—475 **37 Claims**



11. A material cutting method comprising the steps of:

(a) propelling the material relative to and past a cutting apparatus;

(b) actuating the cutting apparatus to cut a first series of sections of said material in accordance with a first cutting schedule, wherein each of said first series of sections has a length between a first maximum and a first minimum value;

(c) determining the length of a remainder portion of said material yet to be propelled past the cutting apparatus;

(d) determining whether there exists a second cutting schedule for adjusting the cut lengths of at least two sections of said remainder which, if executed, will result in said remainder being entirely cut into sections all of which have a length between said first maximum value and said first minimum value, and

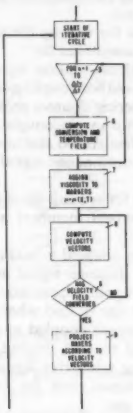
(e) in the event that step (d) determines that such a second cutting schedule exists, cutting said remainder in accordance with said second cutting schedule.

4,534,003

OPTIMIZED REACTION INJECTION MOLDING

Louis T. Manzione, Summit, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,721
Int. Cl.[3] G06F *15/46*; B29G *3/00*
U.S. Cl. 364—476 **9 Claims**



1. A method of making an article by steps comprising flowing at least one fluid into a cavity, and reacting said fluid so as to produce an at least partially polymerized material in said cavity, wherein said fluid comprises a thermosetting fluid, and the parameters of said reacting are chosen so that said fluid in said cavity does not exceed desired limits on at least one of the factors of (1) chemical conversion or (2) temperature, whereby said at least one of the factors is determined by steps comprising simulating said flowing of said fluid by steps comprising dividing said cavity into a plurality of cells, assigning a marker to each cell for carrying information comprising the temperature, chemical conversion, viscosity, and velocity of the fluid in the cell, performing computations to determine said information, moving the marker a distance determined by the computed velocity, and iterating said computations for said fluid during the simulating of said flowing until said cavity is filled with said fluid, and thereafter continuing to compute at least one of said factors, utilizing as an initial condition therefor the final value of said factor computed for the simulating of said flowing.

4,534,004

APPARATUS AND METHOD FOR DETERMINING SIGNAL PARAMETERS OF PERIODIC SQUARE WAVE SIGNALS

Norbert Vollmayr, Traunwalchen, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

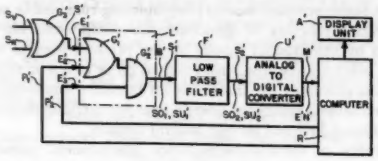
Filed May 20, 1982, Ser. No. 380,272
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122702
Int. Cl.[3] G01R *29/02*
U.S. Cl. 364—486 **13 Claims**

1. An apparatus for determining at least a signal parameter of at least one square wave signal having an upper voltage level and a lower voltage level, said apparatus comprising:

means, responsive to the at least one square wave signal, for generating a time integral, arithmetic mean, analog signal, the value of which corresponds to the signal parameter, said means for generating the analog signal having an upper limit frequency less than the frequency of the square wave signal;

means, responsive to the analog signal, for generating a first digital signal which corresponds to the analog signal;

a digital computer;



means for supplying the first digital signal to the computer; and

means, included in the computer, for determining the signal parameter in response to the first digital signal.

4,534,005

CHAIN SAW

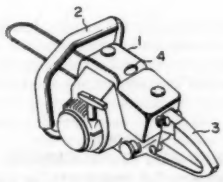
Akira Nagashima, Kawasaki, and Tadashige Kondo, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed May 10, 1982, Ser. No. 376,819

Claims priority, application Japan, May 14, 1981, 56-71427

Int. Cl.³ F01M *1/18*

U.S. Cl. 364—505 **3 Claims**



1. A chain saw provided with an electromagnetic pump for feeding lubricant to saw chain, comprising an engine speed sensor for sensing the rpm of an engine and a microcomputer for controlling the operation of the electromagnetic pump, wherein;

said microcomputer having stored therein a plurality of stepped lubricant feeding patterns covering the number of actuations of the electomagnetic pump, the actuation frequency and the period of time of each actuation so as to control automatically the feeding of lubricant to the saw chain from the electromagnetic pump in response to the engine speed sensor to effect lubricant feeding in conformity with the sawing condition.

4,534,006

OPERATING ARM UNIT CONTROLLED BY A COMPUTER SYSTEM

Giorgio Minucciani, Moncalieri, and Domenico Sola, Turin, both of Italy, assignors to D.E.A. Digital Electronic Automation S.p.A., Turin, Italy

Filed Dec. 14, 1981, Ser. No. 330,650

Claims priority, application Italy, May 15, 1981, 67647 A/81

Int. Cl.³ G05B *13/00*

U.S. Cl. 364—513 **19 Claims**

1. A computer controlled robotic arm unit comprising:

a fixed body,

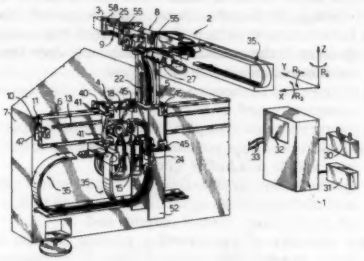
a carriage,

first axis moving means for linearly moving said carriage to said fixed body along a first and substantially horizontal orthogonal cartesian axis,

an elongated column,

second axis moving means for vertically moving said column to said carriage along a second and substantially vertical cartesian axis,

an arm carried by said column, said arm having a work performing member at one end,



third axis moving means for linearly moving said arm along a third and substantially horizontal orthogonal cartesian axis, said third axis being perpendicular to said first axis wherein said second axis moving means comprises an electric motor, and comprising means for maintaining a substantially constant load on said electric motor.

4,534,007

DISPLACEMENT DETECTING SYSTEM IN A MULTI-AXIS MEASURING SYSTEM, ESPECIALLY FOR USE WITH A GEAR WHEEL GRINDING OR INSPECTING MACHINE

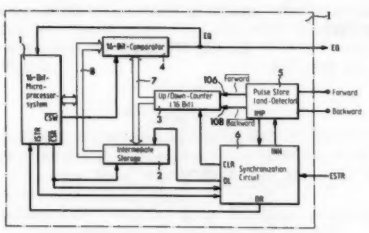
Hans-Ulrich Rhyner, Dübendorf, Switzerland, assignor to Maag Gear-Wheel & Machine Co., Ltd., Zurich, Switzerland

Filed Mar. 7, 1983, Ser. No. 473,091

Claims priority, application Switzerland, Mar. 15, 1982, 1605/82

Int. Cl.³ G06F *15/46*; G05B *19/28*

U.S. Cl. 364—560 **3 Claims**



1. A displacement detecting system in a multi-axis measuring system containing measuring carriages respectively displaceable along a leading axis and at least one other axis in order to generate measuring pulses, especially for use with a gear wheel grinding or inspecting machine, comprising:

a primary computer containing stored therein predetermined restarting points located on the leading axis;

a number of channels corresponding in number to the number of said axes, each channel having a channel input;

each of said channels containing a displacement detector comprising:

a counter for counting a counted value corresponding to the displacement of an associated one of the measuring carriages;

said counter defining an overflow value and having an output;

a comparator having a predetermined bit capacity and an output for supplying a measurement initiating signal in

order to detect a displacement position of at least one of said measuring carriages displaced along said at least one other axis when one of said restarting points is passed by the measuring carriage displaceable along the leading axis;

the output of said comparator being connected to the channel input of the channel associated with the measuring carriage displaceable along said at least one other axis;

a buffer store in which there is stored the counted value present in the counter at the moment when there occurs said measurement initiating signal;

a counter bus connecting said output of said counter to said comparator and to said buffer store;

a microprocessor system including control outputs;

said microprocessor system being connected to said comparator and to said buffer store;

a synchronizer circuit connected to said control outputs of said microprocessor system and provided with a plurality of synchronizer control outputs; and

said plurality of synchronizer control outputs including three synchronizer control outputs respectively connected to said counter, to said buffer store, and to said microprocessor system, in order to block said counter each time prior to reaching said overflow value of the same, to transfer the contents of said buffer store containing the contents of said counter to said microprocessor system, to reset and to reactivate said counter until said counted value of said counter prior to reaching one of said restarting points does not amount to said overflow value of the counter and until said comparator, which has received from the microprocessor system the count remaining up to said restarting point and lying within said bit capacity of said comparator, delivers said measurement initiating signal when said remaining count conforms with a latest count counted by said counter.

4,534,008

PROGRAMMABLE LOGIC ARRAY

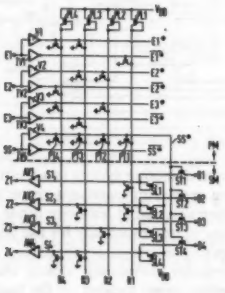
Peter Fuchs, Munich; Klaus Mueller-Glaser, Neuried; Dieter Schuett, Munich, and Wolfgang Wach, Oberschleissheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,311

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1982, 3215671

Int. Cl.³ H03K *19/08*

U.S. Cl. 364—716 **7 Claims**



1. In a programmable logic array of the type in which a product matrix includes product lines and control lines connected to input terminals, in which true and inverted control signals on the control lines link the control lines to the product lines in accordance with a predetermined first programming rule defined by a plurality of first semiconductor components connected at selected crosspoints of the product and control lines, in which the plurality of first semiconductor components selectively places a high or low binary signal on or does not influence the product lines in response to the control signals, and in which a sum matrix includes sum lines forming crosspoints with the product lines and a plurality of second semiconductor components at selected crosspoints in accordance with a predetermined second programming rule, and in which the second plurality of semiconductor components are controlled by the product signals on the product lines to selectively place high or low binary signals on or to not at all influence the sum lines, the improvement therein comprising:

first and second additional control lines for carrying respective additional first and second control signals;

a plurality of third semiconductor components connected between said first additional control line and at least some of the product lines and operated by said first additional control signals for linkage with these product lines; and

a plurality of transfer elements connected to said second additional control line and connected between further input terminals and the sum lines and operable in response to the second additional control signals to connect the sum lines and the additional input terminals.

4,534,009

PIPELINED FFT PROCESSOR

Kevin J. McGee, Newport, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 10, 1982, Ser. No. 376,468

Int. Cl.³ G06F *15/34*

U.S. Cl. 364—726 **9 Claims**

6. A system of calculating the Fast Fourier Transform of data comprising:

a plurality of serially connected subsystems with each subsystem including a subsystem first and second input terminal, a switch having first and second input terminals and first and second output terminals with said switch first input terminal connected directly to said subsystem first input terminal, a first delay having an input and output terminal with said first delay input terminal connected directly to said subsystem second input terminal and said first delay output terminal connected directly to said switch second input terminal, a second delay having an input and output terminal with said second delay input terminal connected directly to said switch first output terminal, and an arithmetic element having a first and second input terminal and a first and second output terminal with said arithmetic element first input terminal connected directly to said second delay output terminal and said arithmetic second input terminal connected directly to said switch second output terminal; and

the first serially connected subsystem and the last serially connected subsystem have the same number of locations in their respective first and second delays.

4,534,010

FLOATING POINT TYPE MULTIPLIER CIRCUIT WITH COMPENSATION FOR OVER-FLOW AND UNDER-FLOW IN MULTIPLICATION OF NUMBERS IN TWO'S COMPLIMENT REPRESENTATION

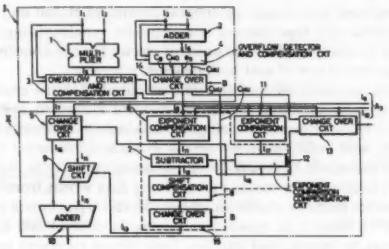
Masahito Kobayashi, Yokohama; Narimichi Maeda, Tachikawa; Yoshimune Hagiwara, Kodaira; Takashi Akazawa, Kodaira, and Shizuo Sugiyama, Kodaira, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,507

Claims priority, application Japan, Oct. 31, 1980, 55-152053

Int. Cl.³ G06F *7/52*

U.S. Cl. 364—748 **4 Claims**



1. An arithmetic circuit for compensation of overflow and underflow in the processing of numbers in two's complement representation comprising first circuit means having a multiplier for multiplying the mantissas of first and second floating point numbers in two's compliment representation and an adder for adding the exponents of said first and second floating point numbers; and second circuit means for adding the outputs of said multiplier and said adder to a third floating point number in two's complement representation; wherein said first circuit means includes first detector means connected to said adder for detecting over- and under-flow conditions of the output of said adder, first compensation means connected to said adder for compensating the output of said adder for a detected over-flow condition prior to application of said output of said second circuit means, second detector means connected to said multiplier means for detecting over-flow of the output of the multiplier resulting from multiplication of said mantissas and second compensation means connected to said multiplier for compensating said over-flow of the output of said multiplier prior to application of said output to said second circuit means; and wherein said second circuit means includes third compensating means responsive to the output of said first detector means for compensating the output of said adder in said first circuit means for a detected underflow condition as part of the adding operation of said second circuit means.

4,534,011

PERIPHERAL ATTACHMENT INTERFACE FOR I/O CONTROLLER HAVING CYCLE STEAL AND OFF-LINE MODES

Lawrence P. Andrews; Chester A. Heath; Justin E. Mead; Richard G. VanDuren, and Gary A. Janes, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,129

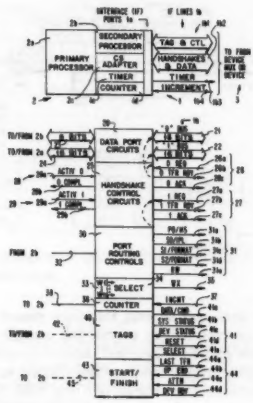
Int. Cl.³ G06F *15/16*

U.S. Cl. 364—900 **7 Claims**

1. An interface for connecting a plurality of different types of devices to a data processor comprising:

data port means connected to said processor and devices, and providing a plurality of signal routing paths between said processor and devices, for transferring data signals to and from said processor in a plurality of different bit-parallel formats and from and to said devices in a plurality of different bit-parallel formats;

handshaking port means connected to said processor and devices for exchanging handshaking control signals with said processor and devices in a plurality of different handshaking formats associated with different said bit-parallel formats, said handshaking means directing transfersd of said handshaking control signals in varying formats between said processor and devices for controlling transfers of data in respectively associated varying bit-parallel formats;



a timer port controlled by command signals from said processor for transferring differing timing reference signals to said devices in conformance with differing data transfer characteristics of said devices;

a source of plural different timing signals;

means for selectively connecting any one of the timing signal produced by said source to said timer port; and

means coupled to said handshaking port means and said timer port for selectively connecting said timer port to said handshaking port means, whereby timing signals transferred to said timer port are applied selectively as handshaking control signals.

4,534,012

PORTABLE PROGRAMMABLE INFORMATION DEVICE AND EXTERNAL PROGRAMMING STATION

Yukio Yokozawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 283,260, Jul. 14, 1981, abandoned. This application Dec. 5, 1983, Ser. No. 558,559

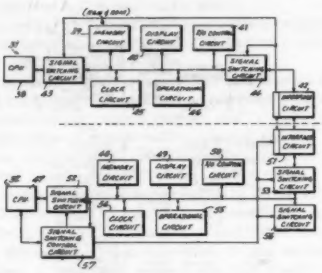
Claims priority, application Japan, Jul. 16, 1980, 55-97247; Jul. 31, 1980, 55-105305; Aug. 20, 1980, 55-114169; Mar. 2, 1981, 56-29557

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—900 **14 Claims**

1. A small-sized portable information system comprising a small-sized portable programmable information device including a first central processing unit, first memory means coupled to said first central processing unit for storing programs and data, first display means coupled to said first central processing unit, first input means coupled to said first central processing unit for the actuation thereof and a first power supply coupled to said first central processing unit, first memory means, first display means and first input means for powering same; a first external station including a second central processing unit, second memory means coupled to said second central processing unit for storing programs and data, second display means coupled to said second central processing unit, second input means coupled to said second central processing unit for the

control thereof and a second power supply coupled to said second central processing unit, second memory means, second display means and second input means for powering same; said first external station being adapted to receive a source program, said first external station including compiler means for compiling said source program, said source program being compiled by said compiler means and converted into an object program; an interface means including a first interface means portion mounted on said portable information device and a second interface means portion mounted on said first external



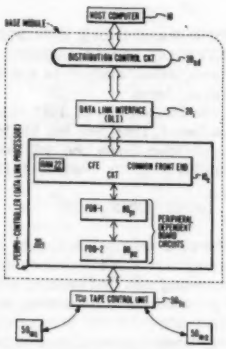
station, said first and second interface means portion being adapted, when coupled, to permit the transfer of said object program from said first external station to said first memory means of said portable information device to program said portable information device to perform said object program, and to permit the transfer of a plurality of data including alphanumeric characters from said first external station to said first memory means of said portable information device, said portable information device being a wristwatch which includes timekeeping circuitry means for keeping actual constant time.

4,534,013

AUTOMATIC WRITE SYSTEM FOR PERIPHERAL-CONTROLLER

Jayesh V. Sheth, El Toro, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 30, 1983, Ser. No. 509,796
Int. Cl.³ G06F 3/00
U.S. Cl. 364—900 **6 Claims**



1. In a network wherein data words are transferred between a main host computer and a magnetic tape peripheral unit via a peripheral-controller, wherein said peripheral-controller is initiated by commands from said host computer to execute data word transfer operations and said peripheral-controller includes a common control circuit unit for sequencing micro-code instructions and a peripheral dependent circuit unit for managing said tape peripheral unit, said peripheral dependent circuit unit having its own internal basic clock unit, an automatic write-logic system for transfer of data words from said host computer to a tape peripheral unit without requiring continuous instructions from said common control circuit unit, said automatic write-logic system comprising:

(a) buffer memory means in said peripheral-controller for temporarily storing blocks of data words being transferred, said buffer memory means having channels of connection to said tape peripheral unit and said host computer;

(b) automatic selection and control means, activated by said common control circuit unit, for enabling an automatic write-logic unit;

(c) a tape control unit connecting a plurality of magnetic tape peripheral units to said peripheral dependent circuit unit and wherein said tape control unit provides synchronizing signals to said peripheral dependent circuit for the transfer of data words out of said buffer memory means;

(d) said automatic write-logic unit functioning, when enabled by said automatic selection and control means, to operate latch register means which provide a data transfer channel from said buffer memory means to said tape control unit, said automatic write-logic unit including:

(d1) latch register means for receiving data words from said buffer memory means for transfer to said tape control unit;

(d2) latching logic means functioning to control said latch register means, said latching logic means receiving input signals from a flag logic circuit means;

(d3) flag logic circuit means connected to receive synchronization and control signals from a synchronization logic means and functioning to provide synchronizing control signals to said latching logic means;

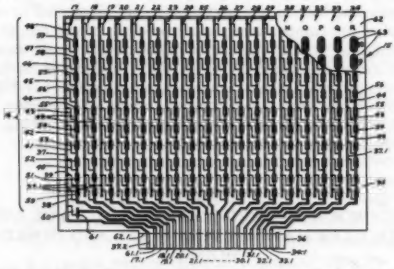
(e) said synchronization logic means receiving clock signals from said tape control unit and providing synchronizing signals to said flag logic circuit means.

4,534,014

MECHANICALLY PROGRAMMABLE READ ONLY MEMORY

Oliver C. Ames, Rte. 2, Box 52A, Clear Lake, Wis. 54005

Filed Jun. 20, 1983, Ser. No. 505,951
Int. Cl.³ G11C 17/00
U.S. Cl. 365—100 **19 Claims**



1. A mechanically programmable read only memory for use with reading circuitry and comprising,

an insulating substrate having a face and an edge portion,

circuit interrupter means including a removable support area on the substrate,

a plurality of resistors on the substrate adjacent the circuit interrupter, each of the resistors having first and second connection ends,

a conductor bus on the substrate and having a connector portion, the bus having connection with the first ends of said resistors, and

a printed conductor on the substrate and traversing said support area, the printed conductor having spaced portions on opposite sides of the support area and respectively connected with the second ends of a pair of the resistors, the printed conductor having a connection portion adjacent one of the resistors, and the printed conductor being opened and disconnected with removal of said support area for disconnecting one of said resistors.

4,534,015

INFORMATION HOLDING DEVICE

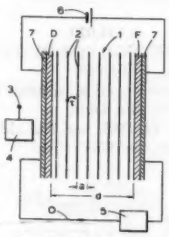
Edward G. Wilson, London, England, assignor to QMC Industrial Research Limited, London, England

Filed Sep. 20, 1982, Ser. No. 420,000

Claims priority, application United Kingdom, Oct. 5, 1981, 8130024

Int. Cl.³ G11C *13/08*

U.S. Cl. 365—106 **18 Claims**



1. A memory for carrying information comprising a multilayer Langmuir-Blodgett film in which each layer is capable of carrying a charge; means for introducing charges into one side of the film in a time sequence which corresponds to the information to be carried, means for applying a voltage between the faces of the film to cause the charge carried by any layer to be transferred to the adjacent layer, and means for reading out the sequence of charges carried by the film.

4,534,016

BEAM ADDRESSED MEMORY SYSTEM

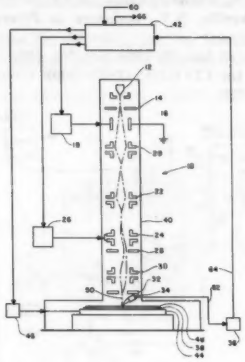
Conilee G. Kirkpatrick, Thousand Oaks, Calif.; Michael S. Adler, and George E. Possin, both of Schenectady, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 8, 1983, Ser. No. 512,070

Int. Cl.³ G11C *11/42*

U.S. Cl. 365—128 **8 Claims**

1. A beam addressed memory system for digital memory recording and reading which comprises electron beam generating and focusing means, electron detecting means, a data storage medium, means for positioning said storage medium, a vacuum chamber, and electronic control and interface circuit means, wherein said data storage medium consists essentially



of a crosslinkable polymeric film having an implanted surface layer of heavy metal ions.

4,534,017

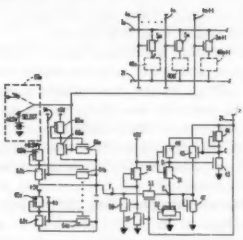
FET MEMORY WITH DRIFT REVERSAL

David R. Thomas, Lexington, Ky., and Paul C. Tien, Redondo Beach, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,160

Int. Cl.³ G11C *11/24*

U.S. Cl. 365—149 **5 Claims**



1. A memory having capacitive sites to be selectively charged to store bits of data,

a plurality of first field effect transistors, each connected as a switch and having a first terminal and a second terminal with connection between said terminals controlled by a gate, said first terminal of each of said first transistors being connected to different ones of said sites,

means connecting said gates of said first transistors to a first source of potential, said first source of potential being above ground in an amount substantially equal to the threshold of said first transistors, said threshold being a substantial potential between said gate and said first terminal which just renders each said first transistor conductive between said first terminal and said second terminal,

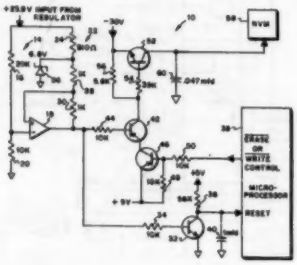
means connecting said second terminal of said first transistors to a second source of potential, said second source of potential being above ground in an amount substantially above said threshold, and

means to selectively connect a third source of potential to the gates of said first transistors, said third source of potential being substantially above said threshold to effect reading of the charge status of one of said capacitive sites.

4,534,018
NON-VOLATILE MEMORY PROTECTION CIRCUIT WITH MICROPROCESSOR INTERACTION

Alton B. Eckert, Norwalk, Conn., and Easwaran C. N. Nambudiri, Hicksville, N.Y., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 29, 1983, Ser. No. 489,971
Int. Cl.³ G11C *11/40*; G06F *1/00*
U.S. Cl. 365—228 **15 Claims**



4. Apparatus for controlling the erasure and writing of data in non-volatile memory of a microprocessor controlled electronic postage meter, comprising:

comparator means with an output terminal for providing output voltages in response to an input voltage signal;

reset signal means electrically coupling the output terminal of said comparator means to the microprocessor which inhibits the generation of erase and write signals in the absence of a predetermined control output voltage at the output of said comparator means;

erase and write control means electrically coupled between a control terminal of the microprocessor and the output terminal of said comparator means;

non-volatile memory switching means electrically coupled to said erase and write control means for supplying an enabling voltage to the non-volatile memory when said non-volatile memory switching means is activated in response to the presence of a control signal from the control terminal of the microprocessor and the presence of the predetermined control output voltage at the output of said comparator means;

said comparator means providing the predetermined control output voltage at its output terminal at a first specified voltage level during a power up cycle and removing the predetermined control output voltage from its output terminal at a second specified voltage level during a power down cycle, the first specified voltage level being greater than the second specified voltage level.

4,534,019
COMMON-DEPTH-POINT METHOD FOR DETERMINING AND DISPLAYING THE SHEAR-VELOCITY REFLECTIVITIES OF A GEOLOGIC FORMATION

Ralphe Wiggins; George S. Kenny, and Carroll D. McClure, all of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1981, Ser. No. 335,437
Int. Cl.³ G01V *1/00*
U.S. Cl. 367—75 **6 Claims**

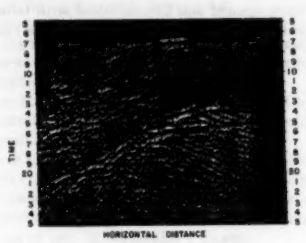
1. A method for determining and displaying at least shear-velocity reflectivities of geologic formations using a compressional common-depth-point seismic data gathering technique, comprising:

(a) collecting a common-depth-point gather of amplitudes for a plurality of angles of incidence (theta) of less than 30°, said angles of incidence (theta) being the angles between the wave normals and the interface normals;

(b) estimating the values of $\sin^2$ (theta) for each of said angles of incidence;

(c) fitting a linear function to the amplitudes vs. $\sin^2$ (theta) for a plurality of points of reflection within said gather;

(d) determining the coefficients of said linear function;



(e) estimating at least the values of shear-velocity reflectivity of said points of reflection by summing said coefficients; and

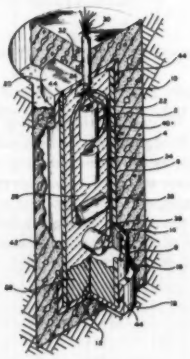
(f) displaying said values in a display configured to generally correspond to a section of said geologic formation,

whereby the nature of shear-velocity reflectivity of said geologic formation is represented by said display.

4,534,020
APPARATUS AND METHOD FOR DETECTING SEISMIC WAVES

John T. O'Brien, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 19, 1981, Ser. No. 313,037
Int. Cl.³ G01V *1/16*
U.S. Cl. 367—188 **5 Claims**



1. An apparatus useful in down hole detection of seismic waves comprising:

(a) a thermoplastic, tubular member having a first end, a second end, and a longitudinal axis;

(b) a first closure means positioned at the first end of the thermoplastic, tubular member, isolating the inside of the tubular member from the outside;

(c) first geophone having a principal axis of sensitivity positioned so that its principal axis of sensitivity is generally parallel to the longitudinal axis of the tubular member;

(d) a second closure means positioned at the second end of the thermoplastic, tubular member and isolating the inside of the tubular member from the outside;

(e) a first pair of wire leads extending from the first geophone and through the second closure means;

(f) a second geophone having a principal axis of sensitivity

positioned with its principal axis of sensitivity at about a right angle with the principal axis of sensitivity of the first geophone;

(g) a second pair of wire leads extending from the second geophone and through the second closure means;

(h) a third geophone having a principal axis of sensitivity positioned with its principal axis of sensitivity at about a right angle with the principal axis of sensitivity of the first geophone and the principal axis of sensitivity of the second geophone;

(i) a third pair of wire leads extending from the third geophone and through the second closure means;

(j) a mass of polymeric material surrounding each of the first, second and third geophones, the geophones being embedded in said polymeric material and

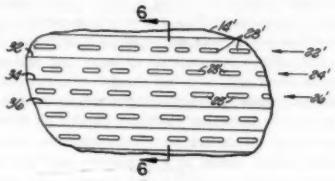
(k) a mass of a second material positioned in a lower portion of the thermoplastic, tubular member, said second material having a density greater than that of the anticipated borehole fluids.

4,534,021

ANGULARLY MULTIPLEXED OPTICAL RECORDING MEDIUM

William V. Smith, Irvine, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Dec. 10, 1981, Ser. No. 329,374
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—47 **5 Claims**



1. Apparatus for reading an optically readable recording medium having a first and a second set of elongate recording surfaces inclined at different angles with respect to one another and having a first and a second set of optically readable information tracks thereon, respectively, comprising:

scanning means for scanning a projected spot of light along said first and along said second set of tracks;

a first pair of photodetectors arranged so as to detect the light from said spot which emanates from said first set of tracks, the first one of said first pair of photodetectors being positioned so as to detect a first portion of said emanative light, and the second one of said first pair being positioned so as to detect a second portion of said emanative light which is spatially distinct from said first portion;

a second pair of photodetectors arranged so as to detect the light from said spot which emanates from said second set of tracks, the first one of said second pair of photodetectors being positioned so as to detect a first portion of said emanative light from said second set of tracks, and the second one of said second pair being positioned so as to detect a second portion of said emanative light from said second set of tracks which is spatially distinct from said first portion of light from said second set of tracks;

first adjustment means for combining in controllably variable relative amounts the signals from said first and said second ones of said first pair of photodetectors; and

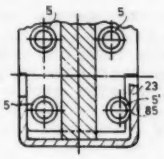
second adjustment means for combining in controllably variable relative amounts the signals from said first and said second ones of said second pair of photodetectors, whereby additive and substractive signal contribution from adjacent tracks can be controllably combined so as to null their effect.

4,534,022

PHONOGRAPH PICK-UP WITH IMPROVED SHIELD GROUNDING

Michael Leipnitz, Am Eichenquast 37, 1000 Berlin 47, Fed. Rep. of Germany

Filed Jul. 25, 1983, Ser. No. 517,112
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1982, 3228299
Int. Cl.³ G11B *3/02*; H04R *11/12*
U.S. Cl. 369—170 **4 Claims**



1. A phonograph pick-up head comprising

a carrying member,

a pick-up cartridge secured to the carrying member, and comprising a mount and an electromagnetic system having coils and pole pieces fitted to said mount, a screening shell surrounding said coils and pole pieces, and connector pins fixed to said mount and electrically connected to the coils, and

means for electrically connecting said screenig shell to one connector pin,

wherein said shell is a tubular shell having an inner surface,

said connector pins are arranged in an asymmetrical pattern, said one pin being disposed at a location offset outwardly such that said one pin is in direct metallic contact with a portion of said inner surface of said shell, and

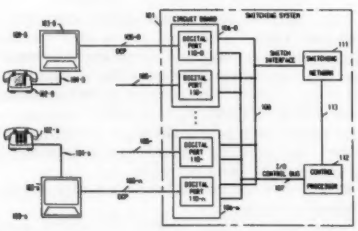
said means consists of said direct metallic contact with said shell.

4,534,023

PLURAL COMMUNICATION CHANNEL PROTOCOL SUPPORT SYSTEMS

Stephen R. Peck, Boulder, and John B. Sharp, Denver, both of Colo., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Oct. 7, 1983, Ser. No. 539,813
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—58 **27 Claims**



1. In a stored program controlled communication system having a processor, a plurality of ports connected by lines to associated stations and a switch for controllably interconnecting said ports, said system further comprising:

means in each port for receiving from an associated station time multiplexed information in the form of cyclically reoccurring frames wherein each frame has a plurality of

fields including an information (I) field and a signalling (S) message field,

means in each port for applying the I field information of each received frame to said switch for extension to another port,

means in each port for assembling the received S field bits of successive frames into groups to form signalling messages,

a receive register in each port,

means in each port for entering each signalling message formed within said port into said receive register of said port,

means in each port responsive to the presence of a signalling message in said receive register of said port for generating a port data ready signal,

said processor being operative for cyclically scanning said ports for the presence of a data ready signal,

said processor being further operative in response to the presence of a data ready signal in a scanned port for applying a read signal to said scanned port, and

means in a scanned port responsive to the receipt of a read signal from said processor for applying a signalling message currently in said receive register of said port to said processor.

4,534,024

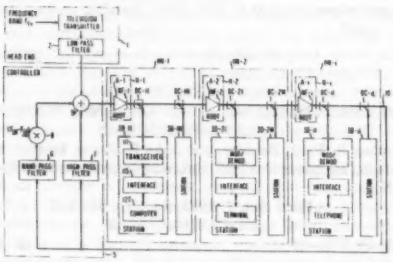
SYSTEM AND METHOD FOR CONTROLLING A MULTIPLE ACCESS DATA COMMUNICATIONS SYSTEM INCLUDING BOTH DATA PACKETS AND VOICE PACKETS BEING COMMUNICATED OVER A CABLE TELEVISION SYSTEM

Nicholas F. Maxemchuk, Mountainside, and Arun N. Netravali, Westfield, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 2, 1982, Ser. No. 446,192

Int. Cl.³ H04J *3/02, 3/00, 6/00;* **H04Q** *11/04*

U.S. Cl. 370—85 **20 Claims**



1. A communication system, said system including a communications path having a headend and at least one branch, a plurality of stations along said communication path which stations are grouped into home networks, at least two of said stations being adapted to be coupled to said communication path, and CHARACTERIZED IN THAT

said communication path including a plurality of first and second type signaling channels and at least one channel assigned to each home network;

said at least two stations including a source station and a destination station;

said source station being adapted to transmit a signaling packet on a first type communication path signaling channel to the headend of said communication path and therefrom to said home networks on a second type signaling channel, said signaling packet for signaling said destination station that said source station has at least one information packet for said destination station;

said destination station being adapted to determine the home network of said source station in response to said signaling packet;

at said destination station, means for determining the home network of said source station; and

means for coupling a destination station receiver to the channel assigned to said source station home network.

4,534,025

VEHICLE MULTIPLEX SYSTEM HAVING PROTOCOL/FORMAT FOR SECURE COMMUNICATION TRANSACTIONS

William M. Floyd, Livonia, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Feb. 24, 1983, Ser. No. 469,591

Int. Cl.³ H04J *3/02, 3/00, 6/00*

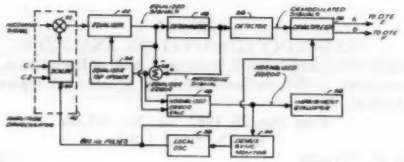
U.S. Cl. 370—85 **14 Claims**

1. A time-division multiplex system for use in an automotive vehicle electrical system subject to an environment of electrical noise, said system including a master controller, one or more remote slave controllers, and serial bus means connecting said master controller with said remote controllers, each said remote controller being capable of receiving and revealing input signals from and/or being capable of providing output signals to one or more respective input and/or output devices, each said remote controller having a particular different address and being responsive to a command for providing a commanded output signal to a respective said one or more output device and/or receiving and revealing an input signal from a respective said one or more input device, said serial bus means including a data bus, said master controller and said respective remote controllers being interactively controlled by a serial data protocol/format on said data bus, said protocol/format comprising successive transactions between said master controller and respective said remote controllers, each said transaction comprising bidirectional, multibyte messages, said master controller including means for providing a multibyte command message and transmitting said message serially to said remote controller means via said data bus, said command message including a particular address byte and a command byte, each said remote controller being responsive to its respective particular address byte and to a said command byte received thereat in said command message for providing a respective said commanded output signal and/or respective said commanded input signal, said addressed remote controller including means for replying to receipt of its particular address byte by providing a multibyte reply message and for transmitting said message serially via said data bus to said master controller, said reply message including the particular address byte of the respective said remote controller means and a response byte indicative of a response to said command received by said remote controller, said master controller including means responsive to receipt of said reply message for verifying that said address byte therefrom conforms with said address byte previously transmitted from said master controller in said transaction and that said response byte therefrom is indicative of the anticipated response to said command byte previously transmitted from said master controller in said transaction and, absent said verification or anticipated response, for at least once repeating said transmission of said command message from said master controller.

4,534,026
NORMALIZED ERROR COMPENSATOR FOR MODEMS USING RADIAL AMPLITUDE MODULATION FOR MULTIPLEXING

Kenneth Martinez, Pinellas Park, and William L. Betts, Madeira Beach, both of Fla., assignors to Paradyne Corporation, Largo, Fla.

Filed Dec. 6, 1983, Ser. No. 558,610
Int. Cl.³ H04J *3/06*
U.S. Cl. 370—100 **3 Claims**



1. A receiver for receiving a series of multiplexed data signals having radial amplitudes selected between a first and second value, every second signal having the same amplitude for demultiplex synchronization comprising:

means for demodulating said multiplexed data signals to produce demodulated signals including means for determining an ideal point for each received signal as mapped in a complex plane;

means for generating an error signal corresponding to said received data signals including means for determining the algebraic difference between said ideal point and the corresponding received signal;

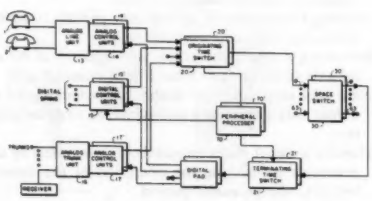
means for generating a synchronizing signal in accordance with said error signal; and

means for demultiplexing said demodulated signals in accordance with said synchronizing signal.

4,534,027
DUPLEX DIGITAL SPAN CONVERSION CIRCUIT ARRANGEMENT

Thomas J. Perry, Phoenix, Ariz., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,490
Int. Cl.³ G06F *11/20*
U.S. Cl. 371—8 **14 Claims**



1. In a telecommunications switching system, a conversion circuit arrangement connected between a plurality of digital spans and a switching network of said switching system for converting received data from said digital spans, said conversion circuit arrangement comprising:

said conversion circuit arrangement including first and second conversion circuit copies, said first and second copies operated to convert digital span data to data compatible with said switching network;

each digital span of said plurality being connected to a first and second copy of one particular conversion circuit;

CPU means connected to each of said first and second copies of said conversion circuit, said CPU means operated to selectively enable said first copy of said conversion circuit to receive data from said connected digital span or said CPU means alternatively operated to selectively enable said second copy of said conversion circuit to receive data from said connected digital span;

said CPU means operated to initially select said first or said second copy of said conversion circuit for receiving data as an active copy and said CPU means further operated to instantaneously select a standby copy of said conversion circuit for detection of a fault of said active copy of said conversion circuit preventing switching network service interruption;

transformer means including first and second copies, said first and second copies of said transformer means connected in parallel to a particular digital span;

said first copy of said transformer means being connected to said first copy of said conversion circuit;

said second copy of said transformer means being connected to said second copy of said conversion circuit;

said first and second copies of said conversion circuit respectively connected to first and second copies of said switching network;

impedance control means connected to said CPU means and operated in response to a first signal of said CPU means to select a first impedance value of said conversion circuit copy for a first value of said first signal or alternatively to select a second impedance value of said circuit for a second value of said first signal;

voltage detection means connected to a corresponding copy of said transformer means and to said impedance control means, said voltage detection means being operated in response to said digital span data to produce a second signal representing a peak amplitude of said digital span data;

voltage divider means connected to said voltage detection means and operated in response to said second signal to produce a third signal representing approximately one-half the amplitude of said second signal; and

comparator means connected to said corresponding copy of said transformer means and to said voltage divider means, said comparator means being operated in response to said digital span data and to said third signal to produce an output signal for said digital span data having an amplitude in excess of said amplitude of said third signal, said output signal being said data compatible with said switching network.

4,534,028
RANDOM TESTING USING SCAN PATH TECHNIQUE

Erwin Trischler, North Brunswick, N.J., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Dec. 1, 1983, Ser. No. 556,812
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—25 **5 Claims**

1. A method of testing a complex digital circuit designed as a serial access scan path and comprising:

(a) a plurality of primary inputs;

(b) a plurality of primary outputs;

(c) a plurality of flip-flops, some of which are selectively connectable into a scan path shift register;

(d) a scan path input connected to one end of said shift register; and

(e) a scan path output connected to the opposite end of said shift register,

said method comprising the steps of:

(1) forming said scan path shift register in said circuit;

(2) clearing said scan path shift register;

(3) applying a first digital test pattern to said primary inputs;

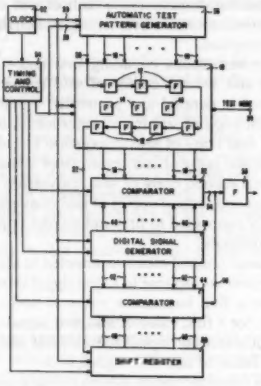
(4) shifting the first digit of a second digital test pattern into said scan path shift register via said scan path input;

(5) comparing the digits appearing at said primary outputs

with those of a first digital number indicative of the proper operation of said circuit;

(6) shifting the next digit of said second digital test pattern into said scan path shift register via said scan path input;

(7) comparing the digits appearing at said primary outputs with those of another digital number indicative of the proper operation of said circuit;



(8) repeating steps (6) and (7) for each successive digit of said second test pattern until all of the stages of said scan path shift register have been filled by digits of said second digital test pattern; and

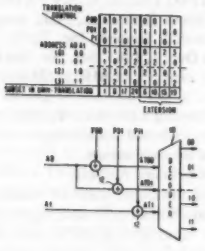
(9) producing a signal indicative of faulty circuit operation if the digits appearing at said primary outputs are not equal to those of the digital numbers to which they are compared.

4,534,029

FAULT ALIGNMENT CONTROL SYSTEM AND CIRCUITS

Shanker Singh, Fishkill, N.Y., and Vijendra P. Singh, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1983, Ser. No. 478,594
Int. Cl.[3] G11C *11/40*; G06F *11/04*
U.S. Cl. 371—10 **5 Claims**



1. In a memory system made up of logical data words each with its bit positions accessed by the same logical address bits through permuting means which converts the logical address to actual address bits of a data bit on the basis of permutation bits that are selected to distribute faulty data bits among the logical data words and thereby eliminate error conditions in the logical data words that are uncorrectable by the error correcting code protecting the memory system, a permuted decoder means comprising:

permutation bit means for supplying n+m permutation bits to be used to permute n of said logical address bits where n and m are positive integers;

permutation means for receiving said n address bits and the n+m permutation bits from said permutation bit means and for providing n+m actual address bits; and

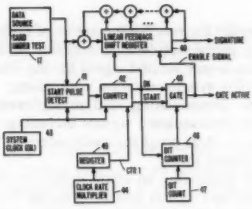
partial decoder means including gate means responsive to the true and complements of the n+m actual address bits for decoding the n+m actual address bits from said permutation means into one of no more than 2^n possible locations.

4,534,030

SELF-CLOCKED SIGNATURE ANALYZER

Ricardo Paez, and Jorge R. Rodriguez, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,506
Int. Cl.[3] G06F *3/04*
U.S. Cl. 371—25 **4 Claims**



1. In signature analysis testing, the method of deriving start, stop and clock signals from the output data stream of the device under test comprising the steps of:

generating a flag signal in the output data stream of the device under test, said flag signal indicating the approach of test output data;

detecting said flag signal;

generating a stream of data clock pulse signals independent of said device under test at a rate equal to or approximately equal to the output data stream bit cell time period;

deriving a start test signal from said flag signal;

using said start test signal and said data clock pulse signals to enable the clocking of said test output data stream into a signature analysis code generator;

counting the number of bit cell time periods to be measured beginning with said start test pulse;

generating a stop pulse when said number of bit cell time periods to be measured have been counted; and

using said stop pulse to disable said clocking of said test output data stream into said signature analysis code generator;

whereby a signal status (signature) is generated by said code generator to indicate the operation of the device under test over the measured period.

4,534,031

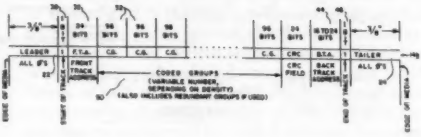
CODED DATA ON A RECORD CARRIER AND METHOD FOR ENCODING SAME

Alan A. Jewer, Ft. Atkinson, Wis., assignor to News Log International, Janesville, Wis.

Continuation-in-part of Ser. No. 404,507, Aug. 2, 1982, , which is a continuation-in-part of Ser. No. 384,582, Jun. 2, 1982,. This application Nov. 29, 1982, Ser. No. 445,241
Int. Cl.[3] G06F *11/10*; G11B *27/00*
U.S. Cl. 371—38 **73 Claims**

1. A method for encoding digital data which is recorded in arcuate tracks without timing or synchronization data on a planar substrate to form a data record carrier with a plurality of arcuate tracks thereon, each track being spaced from an

adjacent track by a predetermined distance along a common centerline of the tracks, each track having the same radius throughout the arcuate path of said track such that each track extends in an arcuate manner across the data record carrier and is arranged in a nested manner relative to adjacent tracks along said common centerline, each track having a plurality of data cells therein and each track having a front track address section, a back track address section and groups of encoded data bits referred to as coded groups therebetween, each cell having



the same cell length in the direction of each track for each bit of data stored in each cell and having the same cell width in a direction tranverse to the direction of each track, each cell for one form of logic (0 or 1) being a non-transition cell and each cell for the other form of logic (1 or 0) being a transition cell, said method of encoding providing error correction and including the steps of: providing in each coded group a plurality of coded words, each word comprising a byte of data bits and a field of parity bits for error correction.

4,534,032

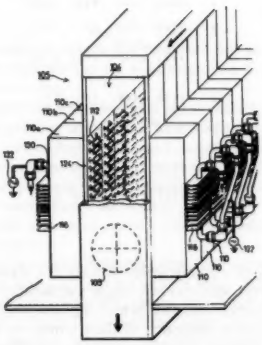
APPARATUS FOR ESTABLISHING AND MAINTAINING A STABLE ELECTRICAL DISCHARGE ACROSS A STREAM OF GAS, AND A HIGH-POWER LASER INCLUDING SUCH APPARATUS

Ethan D. Hoag, Boston, Mass., assignor to Metalworking Lasers International Ltd., Neve Sharett, Ill.X

Filed Sep. 30, 1982, Ser. No. 431,254

Int. Cl.³ H01S *3/04*

U.S. Cl. 372—34 **33 Claims**



1. Apparatus for establishing and maintaining a stable electrical discharge across a stream of gas flowing through a gas flow channel, characterized in that at least a portion of the wall of said gas flow channel is occupied by a plurality of structural elements each including at least one electrode having means for connecting said electrode to an external source of electrical power, and a cooling element in thermal communication with said electrode, said electrode and cooling element being embedded within a block of insulating material extending along the respective portion of the wall of said gas flow channel.

4,534,033

THREE TERMINAL SEMICONDUCTOR LASER

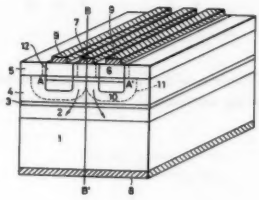
Jun-ichi Nishizawa; Tadahiro Ohmi, and Masakazu Morishita, all of Miyagi, Japan, assignors to Handotai Kenkyu Shinkokai, Japan

Filed Aug. 24, 1982, Ser. No. 411,080

Claims priority, application Japan, Aug. 25, 1981, 56-133106; Jun. 26, 1982, 57-110264

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—50 **23 Claims**



1. A three terminal heterojunction semiconductor laser formed in a semiconductor body having first and second opposing principal surfaces comprising a highly doped anode region of a first conductivity type disposed in said body adjacent to said second principal surface;

an active region where laser oscillation takes place adjacent said anode region;

a highly doped cathode region of a second conductivity type opposite to said first conductivity type disposed in said body adjacent to said first principal surface;

a channel region of said second conductivity type made of a high-resistivity region and formed between said active region and said cathode region;

a highly doped gate region of said first conductivity type surrounding at least a part of said channel region;

at least a part of said anode region and channel region having a wider band gap and a lower refractive index then those of said active region in which light and carriers are confined;

electrodes formed on at least said anode, cathode and gate regions; and

an optical resonator for the laser oscillation wherein a potential barrier at zero gate bias voltage is formed in said channel region by designing the predetermined carrier concentration and dimension of said channel region and the injected carriers into said active region are controlled by said potential barrier controlled according to a gate voltage.

4,534,034

DISCHARGE-PUMPED LASER

Kristian Hohla, and Ernst Albers, both of Göttingen, Fed. Rep. of Germany, assignors to Lambda Physik GmbH, Göttingen, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,221

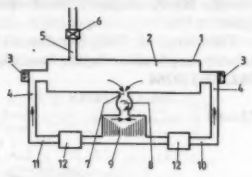
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3212928

Int. Cl.³ H01S *3/22*

U.S. Cl. 372—59 **3 Claims**

1. In a discharge-pumped laser, an arrangement comprising: discharge tube containing a mixture of gases; said discharge tube having gas inlets and windows for closing off ends of said tube, said gas inlets being located in vicinity of said windows; said discharge tube having a gas outlet; a circulating means and purification means, said discharge tube being connected by lines and by said circulating means to said purification means; said purification means comprising an electrostatic filter; said gas circulating means including a quiescence zone wherein a mixture of gases conveyed back to said gas inlets becomes

quiescent, said purification means removing dust particles from said gases and said quiescence zone regenerating said gases for



increasing gas lifetime of the laser, composition of said mixture of gases remaining unchanged by said purification means.

4,534,035

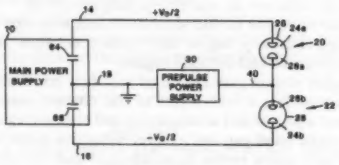
TANDEM ELECTRIC DISCHARGES FOR EXCITING LASERS

William H. Long, Torrance, Calif., assignor to Northrop Corporation, Hawthorne, Calif.

Filed Aug. 9, 1983, Ser. No. 521,713

Int. Cl.³ H01S *3/097*

U.S. Cl. 372—85 **4 Claims**



1. Apparatus for producing an electrical discharge within each of two glow discharge devices, comprising:

two glow discharge devices, each discharge device having two opposing electrodes within an envelope filled with gas such that applying a voltage to the electrodes in excess of a characteristic firing voltage causes a glow discharge in the gas that persists as long as the applied voltage exceeds a characteristic sustaining voltage which is less than the firing voltage, the two discharge devices being electrically connected in series to form a series circuit, and the electrical connection point between the two discharge devices being termed a node;

a main power supply, electrically connected across said series circuit, for producing a voltage greater than or equal to the sum of the respective sustaining voltages of the two discharge devices, so that the main power supply voltage sustains the glow discharge in both discharge devices after the prepulse power supply initiates the glow discharge; and

a prepulse power supply, electrically connected to said node, for applying respective voltages across each of the two discharge devices greater than the respective firing voltages of the discharge devices, the voltages applied to each discharge device being sustained long enough to initiate a glow discharge in that device, and the voltages being applied to the two devices within a short enough time interval of each other so that the glow discharge in one device begins while the glow discharge in the other device is continuing.

4,534,036

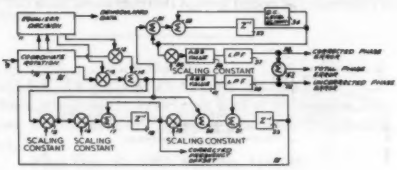
PHASE TRACKING LOOP IMPAIRMENT MONITOR FOR MODEMS

William L. Betts, Maderia Beach, and Kenneth Martinez, Pinellas Park, both of Fla., assignors to Paradyne Corporation, Fla.

Filed Dec. 8, 1982, Ser. No. 447,989

Int. Cl.³ H03L *7/08*

U.S. Cl. 375—10 **4 Claims**



1. In a modem utilizing a phase tracking loop provided to correct phase error by generating an instantaneous phase error signal, a monitor system comprising:

a first circuit for deriving a corrected phase error signal comprising an integrator which integrates said instantaneous error signal, a first absolute value generator means and a low pass filter means; and

a second circuit for deriving an uncorrected phase error signal by averaging said instantaneous phase error signal.

4,534,037

METHOD AND APPARATUS FOR SCRAMBLED PULSE-CODE MODULATION TRANSMISSION OR RECORDING

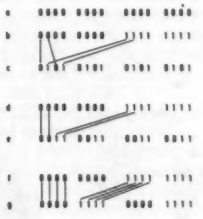
Jürgen Heitmann, Alsbach-Hähnlein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,882

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1981, 3138023

Int. Cl.³ H04K *1/06*; H04N *7/16*

U.S. Cl. 375—25 **4 Claims**



1. Method of processing video signals, for transmission or recording and reproduction in a single transmission or recording and reproduction channel, which signals have previously been encoded into a sequence of data words each of a first predetermined number (n) of pulse-code modulation (PCM) signal bits, which words sequentially correspond to periodic samples of said video signal obtained at successive instants definable by a sequence of clock pulses which also thereby define a sequence of intersample intervals, comprising the steps of:

providing first and second timing signal sequences for respectively defining the beginning of first and second sets of alternate intersample intervals of said sequence of intersample intervals;

inverting alternate words of said sequence in response to one of said timing signal sequences;

interchanging a second predetermined number (m), less than

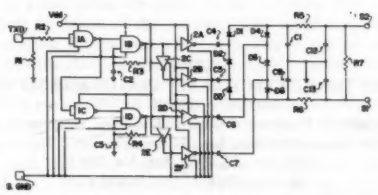
said first predetermined number (n) and greater than one, of bits of each successive pair of words of said data word sequence in response to one of said timing signal sequences and thereby forming a pair of modified words from each said successive pair of words of said data word sequence, and

transmitting a first one of each of said pair of modified words in response to said first timing signal sequence and transmitting a second one of each said pair of modified words in response to said second timing signal sequence immediately following the transmission of the first modified word of the same pair of modified words and thereby producing a continuous stream of modified words obtained at the same rate as said periodic samples to which said data words correspond, said first and said second modified words of each pair being consistently distinguished from each other in all pairs according to which modified word contains the uninverted bits which were not interchanged in the bit-interchange step.

4,534,038
COUPLING AN ELECTRICAL SIGNAL TO TRANSMISSION LINES

David E. Dodds, and Ludo A. Bertsch, both of Saskatoon, Canada, assignors to Develcon Electronics Ltd., Saskatoon, Canada

Filed Feb. 16, 1983, Ser. No. 467,013
Claims priority, application United Kingdom, Feb. 26, 1982, 8205660
Int. Cl.³ H04L *25/12*
U.S. Cl. 375—36 **27 Claims**



1. A coupling device for conditioning an input electrical signal for transmission on a transmission line, said coupling device comprising:

an input port for receiving said input electrical signal;

an output port for connection with said transmission line, said output port including first and second terminal means;

capacitance means connected with said terminal means;

charge pump means for charging said capacitance means said charge pump means including:

a first diode means; a second diode means having first and second leads;

and first and second isolating capacitor means each including an input side lead and a line side lead, said line side of said first isolating capacitor means being connected with said first lead of said second diode means and said line side lead of said second isolating capacitor means being connected with said second lead of said second diode means;

said first diode means being connected in series with said first lead of said second diode means, said first and second diode means being connected in series between said first and second terminal means so as to permit passage of current in a first direction between said first and second terminal means;

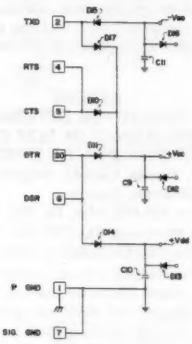
voltage driving means for alternately applying positive and negative voltage difference between said input side lead of said first isolating capacitor means and said input side lead of said second isolating capacitor means;

and a voltage controlling means for controlling said voltage driving means in response to said input electrode signal.

4,534,039
DATASET POWERED BY CONTROL AND DATA SIGNALS FROM DATA TERMINAL

David E. Dodds, and Ludo A. Bertsch, both of Saskatoon, Canada, assignors to Develcon Electronics Ltd., Saskatoon, Canada

Filed Feb. 16, 1983, Ser. No. 467,014
Claims priority, application United Kingdom, Feb. 26, 1982, 8205660
Int. Cl.³ H04B *3/44*
U.S. Cl. 375—36 **8 Claims**

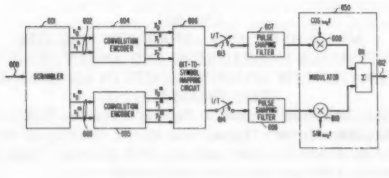


1. In data communication apparatus of the type comprising a data terminal apparatus for developing electrical data signals and a dataset apparatus for modifying and controlling the data signals prior to transmission along transmission lines, said data terminal apparatus including means for developing said electrical data signals and means for developing control signals and separate terminal connectors at which said data signals and control signals are presented, said dataset apparatus including separate terminal connectors for receiving said separate data signals and control signals and power supply means connected to a plurality of said terminal connectors for receiving said data signals and control signals and capacitor storage means for storing positive and negative voltages extracted solely from said control and data signals so as to provide power supply voltage for said dataset apparatus.

4,534,040
METHOD AND APPARATUS FOR CODING A BINARY SIGNAL

Hemant K. Thapar, Marlboro, N.J., assignor to AT&T Information Systems, Holmdel, N.J.

Filed Jan. 4, 1983, Ser. No. 455,502
Int. Cl.³ H04L *3/00*
U.S. Cl. 375—39 **8 Claims**



1. Apparatus for encoding a sequence of input bits for transmission via a quadrature amplitude modulated carrier signal, comprising:

means responsive to first and second subsets of selected bits in each group of N consecutive ones of said input bits for forming first and second expanded versions of the bits in

each of said first and second subsets, respectively, each of said expanded versions having at least one more bit than the subset from which it is formed, and

means individually responsive to said first and second expanded versions for modulating in-phase and quadrature components of said carrier signal to generate an individual one of a predetermined constellation of signal points,

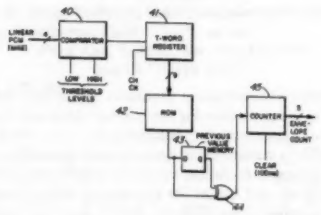
wherein said forming means includes means for combining at least one bit in said first subset with at least one bit in the first subset of a preceding one of saidn N-bit groups and means for combining at least one bit in said second subset with at least one bit in the second subset of a preceding one of said N-bit groups, said combining and modulating means being arranged such that less than all possible sequences of said signal points is generated.

4,534,041

DIGITAL CIRCUIT FOR DETERMINING THE ENVELOPE FREQUENCY OF PCM ENCODED CALL PROGRESS TONES IN A TELEPHONE SYSTEM

Ernst A. Münter, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 359,896, Mar. 19, 1982, Pat. No. 4,439,639.
This application Aug. 31, 1983, Ser. No. 528,170
Int. Cl.³ G06F *15/36*
U.S. Cl. 375—94 **4 Claims**



1. A digital envelope detector circuit for determining the envelope frequency of a PCM encoded call progress tone in a telephone system comprising, circuit means for converting the PCM signal to a linear PCM signal having a sign bit and a magnitude portion and for normalizing the PCM signal to a predetermined level, a comparator circuit responsive to the magnitude portion of the linear PCM signal and to upper and lower threshold reference signals for providing a chopped signal, a threshold filter responsive to the output signal of the comparator circuit for generating a bilevel signal having a frequency corresponding tc the envelope frequency of the linear PCM signal, and a counter circuit responsive to the bilevel signal and to timing signals for counting in a predetermined period of time the transitions between low and high levels of the bilevel signal, the count signal from the counter corresponding to said envelope frequency.

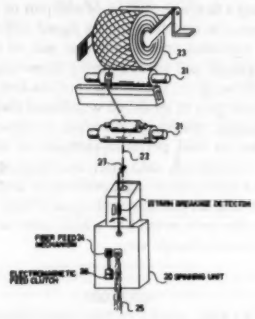
4,534,042

METHOD OF AND APPARATUS FOR THE CONTINUOUS MONITORING AND ANALYSIS OF THE OPERATION OF SPINNING UNITS IN AN OPEN-END SPINNING MACHINE

Zdenek Marsícek; Jaroslav Janeba; Antonín Pácha; Ales Pastrnák; Jaroslav Dykast, and Roman Prazák, all of Ústí n/Orl., Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Aug. 6, 1982, Ser. No. 405,927
Claims priority, application Czechoslovakia, Oct. 24, 1981, 7776-81
Int. Cl.³ H03K *21/34*
U.S. Cl. 377—16 **8 Claims**

1. A method for a continuous monitoring and analysis of the operation of spinning units in multiple unit open-end spinning machine, each unit being equipped with a fiber feeding mechanism, comprising switching on and off an electric circuit which governs the supplying of fibers into the individual spinning units, monitoring an active or inactive operation state of the said individual spinning units by a continuous sampling with



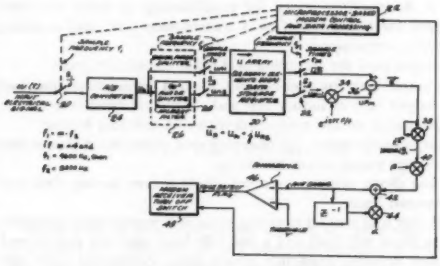
scanning checking signals that cause a predetermined short-time breaking of the said electric circuit which governs their fiber feeding mechanism, and counting thus obtained different information checking signals for a subsequent analysis of the number of active and inactive spinning units for the machine.

4,534,043

TEST TONE DETECTOR APPARATUS AND METHOD MODEM USING SAME

Vedavalli G. Krishnan, Miami Lakes, Fla., assignor to Racal Data Communications, Inc., Miami, Fla.

Filed Jun. 27, 1983, Ser. No. 508,103
Int. Cl.³ G06F *15/31*; H04M *1/50*
U.S. Cl. 375—104 **8 Claims**



7. A method of detecting a pure tone signal, said method comprising:

generating pairs of successive output electrical signals U_{n1}, U_{n2} which represent the phase quadrature components of an incoming signal at successive sampling time intervals t_n;

generating predicted digital signals based on said sample signals U_{n1}, U_{n2} and having values which are expected to occur at future sample times if the incoming signal is a single frequency sinusoid; and

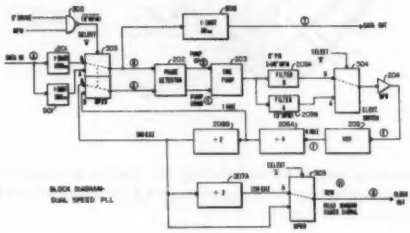
comparing the respectively corresponding actual and predicted digital signals to generate a tone detection output based on the difference between said actual and predicted signals.

4,534,044

DISKETTE READ DATA RECOVERY SYSTEM

Michael J. Funke, Westford, Mass.; Douglas A. Topliffe, Nashua, N.H., and Donald J. Rathbun, Andover, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 2, 1983, Ser. No. 490,613
Int. Cl.[3] H03L 7/06; G11B 5/09
U.S. Cl. 375—120 8 Claims



1. A read data recovery system for generating a clock which is locked to an incoming data stream comprising:

(a) a clock means including an oscillator and frequency divider for generating clock signals in synchronism to incoming data signals;

(b) second means coupled to said clock means for comparing the phase of the clock signals with the phase of the incoming data signals, and including third means for providing a first signal when the phase of the incoming data signal leads the phase of the incoming data signal and further including fourth means for providing a second signal when the phase of incoming data signal lags the phase of the clock signal;

(c) fifth means coupled to said second means and responsive to said third and fourth means for either increasing or decreasing the frequency of the clock signals; and

(d) sixth means for selecting and applying to the second means a first frequency divided ouput from the oscillator when the system receives data signals having a first frequency and a second frequency divided output from the oscillator when the system receives data signals having a second frequency.

4,534,045

DEVICE FOR RECORDING HOST ELECTRONIC INSTRUMENT OPERATING ON-TIME

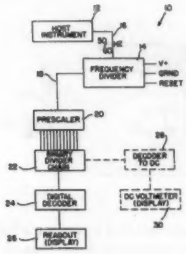
Warren Collier, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 28, 1983, Ser. No. 555,745
Int. Cl.[3] G07C 3/04
U.S. Cl. 377—16 5 Claims

1. Device for host electronic instrument operating time recording, comprising:

a frequency divider circuit means for counting line voltage transitions during power-on time of said host instrument and for generating binary number signals,

a prescaler circuit means for receiving said binary number signals and dividing said binary number signals by a predetermined numerical value to establish a reduced time resolution for the power-on time of said host instrument, binary divider chain circuit means which receives the prescaled output signal from said prescaler and generates a digital number output, and



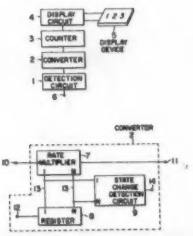
display means for receiving said digital number output for visual readout of the power-on time of said host instrument.

4,534,046

FLOW QUANTITY MEASURING APPARATUS

Yuji Mihara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 24, 1982, Ser. No. 423,291
Claims priority, application Japan, Oct. 26, 1981, 56-171090
Int. Cl.[3] G01P 5/00
U.S. Cl. 377—21 4 Claims



1. A flow quantity measuring apparatus comprising:

a detection circuit which produces a pulse signal corresponding to a flow speed of fluid to be measured;

a converter which converts said pulse signal into an electric signal corresponding to a flow quantity of said fluid; and

a counter for counting the number of said electric signals,

said converter including a rate multiplier which receives said pulse signal and multiplies it by a stored predetermined present value to produce a rate multiplied output signal, a register for storing said preset value, and a state change detection circuit for detecting a change of a state of said register and providing an output signal indicative of said change of state.

4,534,047

MASK RING ASSEMBLY FOR X-RAY LITHOGRAPHY

Warren Deschenaux, Shelton; Gregory Hughes, Norwalk; Justin Kreuzer, Trumbull, and Carlo La Fiandra, New Canaan, all of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

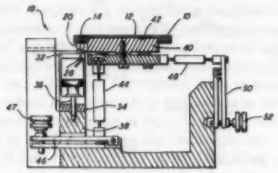
Filed Jan. 6, 1984, Ser. No. 568,776
Int. Cl.[3] G03B 11/00; G02B 7/00; G03F 5/00
U.S. Cl. 378—35 11 Claims

1. In combination:

a mask ring, a mask membrane having a mask pattern thereon mounted on said mask ring;

an alignment cartridge;

a plurality of kinematic mounts for removably mounting said mask ring on said alignment cartridge;



each of said kinematic mounts including a funnel-like shaped seat member and a mating ball-like shaped member, one of said members being mounted on said mask ring and the other of said members being mounted on said alignment cartridge.

4,534,048

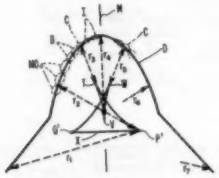
METHODS OF INCREASING ANTERIOR LAYER THICKNESS OF CONTINUOUS DENTAL IMAGES OBTAINED THROUGH ROTATIONAL PANORAMIC RADIOGRAPHY

Ulf E. S. Welander, Umea, Sweden; William D. McDavid, and Charles R. Morris, both of San Antonio, Tex., assignors to Penawalt Corporation, Philadelphia, Pa.

Filed Jan. 3, 1983, Ser. No. 455,095

Int. Cl.³ G01N *21/00, 23/00*; G03B *41/16*

U.S. Cl. 378—39 **11 Claims**



1. In a rotational panoramic radiographic method for widening the layer of a dental arch at an anterior region thereof of a patient seated in a moving chair orbited by a tubehead-camera assembly to produce moving effective centers of rotation of X-ray beams projected from said tubehead, and means to move film within said camera at a non-linear speed, the improvement comprising the step of

causing said effective centers of rotation of beams projecting said anterior region to be displaced more interiorly of said dental arch than effective centers of rotation of beams projecting canine regions.

4,534,049

FLUORESCENT X-RAY FILM THICKNESS GAUGE

Toshiyuki Koga, Gotenba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

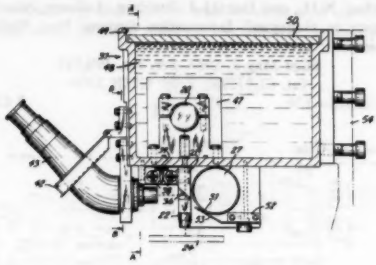
Continuation of Ser. No. 258,518, Apr. 28, 1981, Pat. No. 4,406,015. This application Aug. 10, 1983, Ser. No. 522,041

Claims priority, application Japan, Sep. 22, 1980, 55-135058

Int. Cl.³ G01N *23/20*; G21K *1/00*

U.S. Cl. 378—050 **14 Claims**

1. In a fluorescent X-ray film thickness gauge having an X-ray tube for irradiating X-rays along an X-ray axis to a sample having a film whose thickness is to be measured, and a detector for detecting fluorescent X-rays emitted from the sample: viewing means for enabling an observer to view along the X-ray axis the spot on the sample at which the X-ray beam is to be directed, the viewing means including a mirror positionable along the X-ray axis at a predetermined position to enable viewing of the spot on the sample, the mirror being displaceable into and out of the predetermined position; and



collimating means for collimating the X-rays into an X-ray beam and directing the X-ray beam along the X-ray axis to the said spot on the sample.

4,534,050

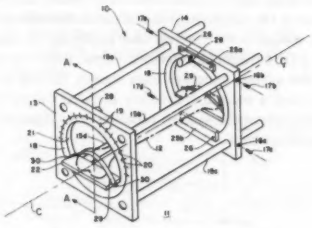
X-RAY GONIOMETER

Howard W. Smith, Lawrence, Kans., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 9, 1982, Ser. No. 448,162

Int. Cl.³ A61G *13/00*; A61B *17/00*

U.S. Cl. 378—81 **7 Claims**



1. A goniometer device for supporting a specimen on an X-ray apparatus during X-ray filming, which comprises:

a. first and second upright endplates;

b. a plurality of connecting rods and means for connecting said rods at respective ends thereof to said endplates for holding said endplates in a spaced parallel relationship on said X-ray apparatus;

c. a first support, rotatably mounted to said first endplate, said first support and first endplate defining a first opening therethrough, for receiving and supporting a first end of said specimen, and a second support, rotatably mounted to said second endplate, said second support and second endplate defining a second opening therethrough, for receiving and supporting a second end of said specimen, said supports being rotatable about a common axis substantially perpendicular to said endplates; and

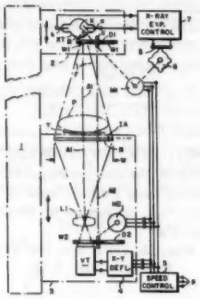
d. a set of reference marks on each said endplate and said rotatable support for gaping the angular position of said supports about said axis relative to said endplates.

4,534,051

MASKED SCANNING X-RAY APPARATUS

John K. Grady, 300 Foster St., Littleton, Mass. 01460, and Richard E. Rice, Arlington, Mass., assignors to John K. Grady, Harvard, Mass.

Filed Dec. 27, 1982, Ser. No. 453,749
Int. Cl.[3] H04N 7/18
U.S. Cl. 378—099 24 Claims



1. An X-ray system for radiological examination of a subject comprising:

an X-ray beam source of finite size radiating through the position of a radiological subject to an imaging area;

an X-ray receptor at the imaging area emitting secondary radiation on receipt of X-rays;

moving X-ray mask means between the source and receptor including an X-ray window transmitting a shaped X-ray beam of width scanning across and through the subject position to the receptor to produce a secondary radiation image at the imaging area;

electro-optical means viewing the imaging area for utilization of the secondary image; and

moving light mask means between the receptor and electro-optical viewing means including a light window transmitting the secondary image;

wherein the X-ray and light mask means include means for adjusting the width of the mask windows, thereby to minimize the fraction of scattered radiation reaching the X-ray receptor while operating the X-ray tube within its power capacity and to adjust the intensity of the light image transmitted to the electro-optical light viewing means.

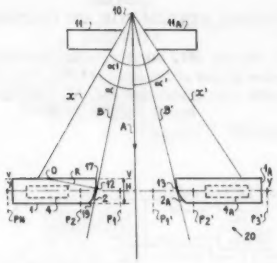
4,534,052

BLOCK FOR PARTIALLY LIMITING A RADIATION BEAM, AND A COLLIMATOR COMPRISING SUCH BLOCKS

Jacques Milcamps, Buc, France, assignor to C.G.R. - Mev, Buc, France

Filed Apr. 4, 1983, Ser. No. 481,784
Claims priority, application France, Apr. 2, 1982, 82 05785
Int. Cl.[3] G21K 1/04
U.S. Cl. 378—152 9 Claims

1. A block for partially limiting a radiation beam emitted by a radiation source in a given reference direction, for limiting a first part of the beam corresponding to a maximum half angle of opening, said block being formed by a limiting block having moving means for allowing said limiting block to move in a parallel direction to a first axis transverse to said reference direction, said limiting block comprising a cylindrical active surface which defines limits for the beam, said limits being a function of the position which said cylindrical active surface occupies along said first axis, said moving means allowing movement of said limiting block such that the orientation of the active surface is not modified and said limits are tangential



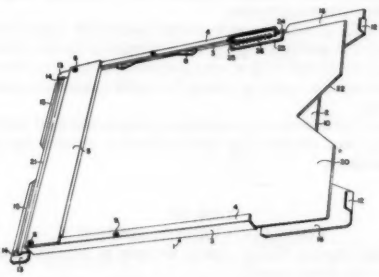
to the cylindrical active surface for all positions of said limiting block.

4,534,053

APPARATUS FOR EXCHANGING AN INTENSIFYING SCREEN AND A NEGATIVE IN A FILM PACKET

Vaito K. Eloranta, Needham; Joel M. Peisach, Malden, and Donald E. Rogers, Jr., Billerica, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 19, 1982, Ser. No. 369,806
Int. Cl.[3] G03B 17/26, 41/18
U.S. Cl. 378—167 3 Claims



1. Apparatus for manipulating a film packet comprising an opaque envelope, a photosensitive sheet slidably received in said envelope and attached to a nonphotosensitive leader extending out through an open end of the envelope, and a flap secured to said leader and adapted to cover the open end of the envelope and form a light tight seal around the photosensitive sheet, said apparatus comprising a base plate of opaque material having major dimensions exceeding those of the envelope, a platen of opaque material, means slidably mounting said platen on said base plate for movement between first and second positions, means mounted on said base plate for resiliently biasing said platen into engagement with said base plate, means forming a lip on a leading edge of said base plate adapted to engage the flap on the film packet when the envelope is inserted between said platen and said base plate to limit movement of the photosensitive sheet between said platen and said base plate, and means forming a stop at a trailing edge of said base plate opposite said leading edge for limiting movement of the envelope inserted between said platen and said base plate to a position in which the open end of the envelope is clear of the flap but still overlies the nonphotosensitive trailer without exposing the photosensitive sheet within the envelope,

whereby an intensifying screen may be inserted into the envelope.

4,534,054

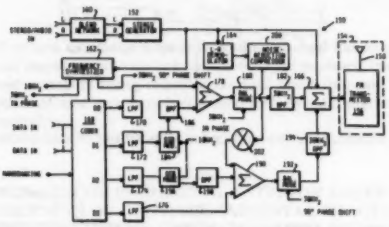
SIGNALING SYSTEM FOR FM TRANSMISSION SYSTEMS

Douglas A. Maisel, 2412 6th St., Berkeley, Calif. 94710

Continuation-in-part of Ser. No. 211,307, Nov. 28, 1980, Pat. No. 4,388,493. This application Jun. 14, 1983, Ser. No. 504,267

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—4 **11 Claims**



1. In a stereo transmission system for generating and transmitting an FM multiplex signal derived from left and right audio frequency stereo channels, said multiplex signal including a sum channel containing the summed left and right stereo channel signals and a difference channel containing the difference between said left and right stereo channel signals, said difference channel being modulated on a first subcarrier, a signaling system comprising:

means for developing at least one quadrature subcarrier in said FM multiplex signal and for modulating said quadrature subcarrier with at least one selected signal to develop information carrying sidebands of said quadrature subcarrier;

means for substantially minimizing degradation of each of said sum channel and said difference channel by said sidebands.

4,534,055

CODE CONVERSION SYSTEM

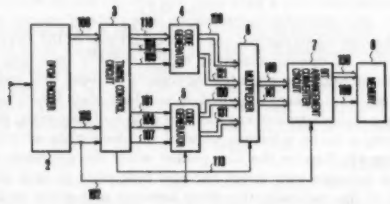
Kazumoto Iinuma, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 288,013, Jul. 29, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 550,946

Claims priority, application Japan, Aug. 4, 1980, 55-106926; Aug. 4, 1980, 55-106927; Aug. 4, 1980, 55-106928; Aug. 4, 1980, 55-106929; Aug. 4, 1980, 55-106930

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—34 **6 Claims**



1. In a code conversion system comprising an encoder, said encoder comprising an input terminal for receiving a multilevel time series signal having at least three signal levels subject to a variation of occurrence frequency of signal levels, means for detecting the highest occurrence frequency signal ("HOFS") level of said multi-level time series signal and generating a first code representative of the run-lengths of said HOFS level; means for generating a second code representative of the signal levels of said multi-level time series signal where the first code and second code, each include at least one first and second transition code respectively, wherein occurrences of the first transition code indicate transitions from the first code to the second code and occurences of the second transition code indicate transitions from the second code to the first code, and means for combining said codes from said first and second code generation means on the time series so as to produce a coded signal containing said first and second codes in combination.

4,534,056

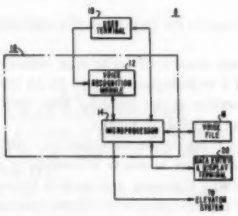
VOICE-RECOGNITION ELEVATOR SECURITY SYSTEM

Michal M. Feilchenfeld, Pittsburgh; Roger G. Byford, Washington Township, Armstrong County, both of Pa., and Wing C. Quan, Waldwick, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1982, Ser. No. 411,792

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—42 **21 Claims**



1. A voice-controlled elevator security system, including at least one elevator car mounted in a building having a plurality of floors, including a lobby floor, wherein authorized users are each pre-enabled to gain access to a predetermined floor, or floors, of the building from the lobby floor and each authorized user has provided template utterances, said voice-controlled elevator security system comprising:

first memory means for storing template utterances of authorized users, with said template utterances being represented by a plurality of binary bits;

second memory means for storing preselected landings to which each authorized user is permitted access;

digitizing means for digitizing a prospective user's spoken utterance, with the user's digitized spoken utterance being represented by a plurality of binary bits;

recognition means for comparing the prospective user's digitized spoken utterance with at least certain of the template utterances, and for selecting a template utterance having the largest number of binary bits in agreement with the binary bits of the digitized spoken utterance;

threshold means for establishing a threshold limit;

comparator means for comparing the number of binary bits in agreement with said threshold limit and for producing an enable signal when the number of binary bits in agreement exceeds said threshold limit;

said enable signal indicating that the prospective user is the authorized user associated with the selected template;

and call selecting means responsive to said enable signal for enabling a recognized authorized user to gain access to an elevator car at the lobby floor;

said call selecting means further being responsive to said enable signal for enabling the recognized authorized user to direct the accessed elevator car only to an associated pre-enabled floor;

said call selecting means including landing selecting means

in the at least one elevator car and up-call selecting means at the lobby floor, wherein activation of the voice controlled elevator security system disables the landing selecting means in the at least one elevator car, except the landing selecting means for the lobby floor, and disables the up-call selecting means on the lobby floor, and wherein identification of the user as an authorized user automatically activates the up-call selecting means on the lobby floor and enables the landing selecting means in the at least one elevator car for those floors to which the authorized user has been pre-enabled to gain access.

4,534,057

FREQUENCY RESPONSE DISPLAY FOR USE WITH A GRAPHIC EQUALIZER

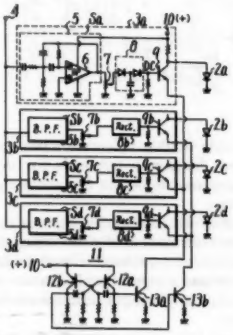
Toshihiko Miyata, Yokohama, and Takashi Shibata, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 23, 1982, Ser. No. 452,613

Claims priority, application Japan, Dec. 24, 1981, 56-196372[U]

Int. Cl.³ G01R 23/17

U.S. Cl. 381—58 **7 Claims**



1. A frequency response display for use with a graphic equalizer comprising: an input terminal supplied with an audio signal to be displayed; two groups of control circuits, in which each control circuit consists of a band pass filter means with a center frequency and connected to the input terminal, a rectifier for receiving and rectifying the output signal from the band pass filter means, and a drive circuit means connected to the rectifier for driving a display device when the output signal of the rectifier exceeds a predetermined value; the center frequencies of said band pass filters being different from each other, and furthermore each center frequency of said band pass filters in one group of control circuits being between adjacent two center frequencies of the band pass filters in the other group of control circuits; and switching means connected to the drive circuit means in each of said control circuits for alternately operating the drive circuit means in one group of control circuits and the drive circuit means in the other group of control circuits.

4,534,058

ELECTRONIC STETHOSCOPE WITH AUTOMATIC POWER SHUT-OFF

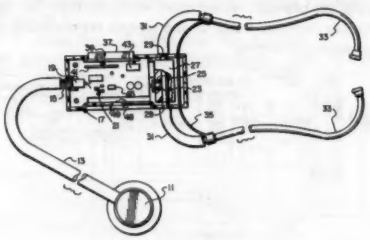
Larry H. Hower, New York, N.Y., assignor to The Hart Group, Dallas, Tex.

Filed Mar. 29, 1983, Ser. No. 480,062

Int. Cl.³ H04R 1/46

U.S. Cl. 381—67 **10 Claims**

1. In an electronic stethoscope comprising a pickup head; a microphone; a tubular accoustic connection between the pickup head and microphone; an amplifier circuit receiving an input from the microphone; a speaker coupled to the output of the amplifier circuit; a binaural headpiece; and tubular accoustic coupling means coupling the output of the speaker to the binaural headpiece, the improvement comprising: a switch by



means of which a momentary on operation can be achieved; and a timer responsive to said switch to couple power to said amplifier circuit, said timer adapted to shut off power after a predetermined period of time.

4,534,059

METHOD FOR CORRECTING GRADATION OF OUTPUT DATA, FOR USE IN A PICTURE DIGITAL PROCESSING SYSTEM

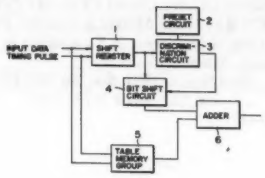
Mitsuhiko Yamada, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 30, 1982, Ser. No. 429,296

Claims priority, application Japan, Oct. 13, 1981, 56-162016

Int. Cl.³ G06K 9/36

U.S. Cl. 382—54 **9 Claims**



1. A method for correcting gradation of output digital data for reproducing a picture image, for use in a picture digital processing system wherein input digital picture data represented by digital bits is processed and corrected by using at least one lookup table memory having input-output characteristics, the improvement comprising the step of adding as correction data a variable number of lower bits to the data output from said lookup table memory after said input data has been input to and corresponding data has been output from said lookup table memory, the quantity of lower bits being varied depending on both the input data itself and the relationship of said input data to said input-output characteristics of said at least one lookup table memory, said lower bits being the least significant bits in said digital data.

4,534,060

METHOD AND APPARATUS FOR REMOVING NOISE AT THE ENDS OF A STROKE

Jean R. Ward, Arlington, Mass., assignor to Pencept, Inc., Waltham, Mass.

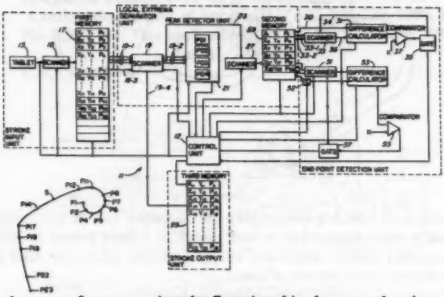
Filed Aug. 9, 1983, Ser. No. 521,729

Int. Cl.³ G08C 25/00

U.S. Cl. 382—54 **9 Claims**

7. Apparatus for use in processing a first series of digital signals emitted by a digitizing tablet representing the positions of a stylus during a stroke on the tablet to minimize noise at an end of the stroke comprising:

a. means for comparing the signals representing each position with the signals representing positions adjacent thereto to form a second series of signals comprising only these signals from said first series representing positions having an ordinate value more extreme that the corresponding ordinate value of the signals representing positions adjacent thereto.



b. means for comparing the first signal in the second series of signals at that end of the stroke with each suceeding signal in said second series to determine a furthest signal from said first signal that is within a predetermined threshold, and

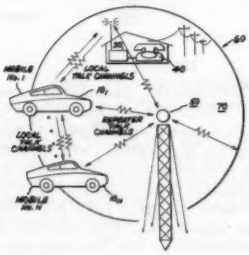
c. means for forming a third series of signals from said first series but starting with said furthest signal from said first signal that is within said predetermined threshold.

4,534,061

DETERMINISTIC MULTI-ACCESS METHOD FOR A DECENTRALIZED MOBILE RADIO SYSTEM

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,197
Int. Cl.³ H04B *7/14, 7/00*
U.S. Cl. 455—17 **12 Claims**



12. In a decentralized radio system including a plurality of stations wherein a plurality of data channels are provided for communication between said stations, a method for establishing a communication link between a calling station and a called station comprising the steps of:

providing a plurality of control channels for performing a handshake routine between said calling station and said called station before establishing communication over one of said plurality of data channels;

monitoring at each station a predetermined one of said control channels;

monitoring at said calling station the particular control channel being monitored by said called station until this channel is determined to be idle for a first predetermined time interval;

transmitting a control packet from said calling station to said called station on said particular channel after said particular channel has been determined to be idle for said first time interval; and

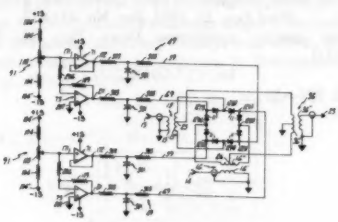
monitoring said particular control channel at said calling station after transmitting said control packet to determine if a response packet is received from said called station and, if so, establishing communication between said calling station and said called station over one of said plurality of data channels.

4,534,062

ADJUSTABLE DOUBLE BALANCED MIXER

Samuel Levinson, Norwalk, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 30, 1984, Ser. No. 575,380
Int. Cl.³ H03C *1/58;* **H04B** *1/26*
U.S. Cl. 455—330 **8 Claims**



1. An adjustable double balanced mixer circuit including input and output frequency terminals for mixing a pair of frequencies to generate an output frequency signal, said mixer circuit comprising:

ring diode means for developing a mixed signal freuqency, including an even number of diode means for directing the flow of electric current, each of said diode means including an input and output terminal and connected at its output terminal to the input terminal of one other of said diode means;

first and second DC injection means for applying selected DC current levels of opposite polarity to symmetrical opposite ones of said input terminals, the injection of DC currents being conducted at input terminals which are symmetrically disposed about said ring diode means, to compensate for dissimilarities among said diode means, each of said DC injection means including first and second amplifier means for developing respective first and second DC injection currents;

first and second RF injection means for respectively applying first and second signal frequencies to input terminals of said ring diode means, symmetrically interleaved with the input terminals subject to DC current injection.

4,534,063

PAGING RECEIVER AND SUPPORTING RECEPTACLE THEREFOR

Donald K. Krumin, Ft. Lauderdale, Fla., and Orville W. Larson, Carmell, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1982, Ser. No. 452,249
Int. Cl.³ H04B *1/08;* **A45F** *5/02;* **A45C** *11/00*
U.S. Cl. 455—344 **12 Claims**

1. A receptacle and a paging receiver with an information display, comprising in combination:

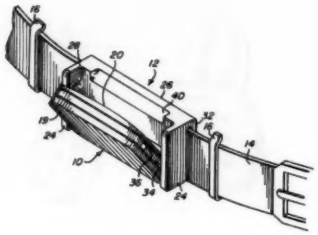
means for securing said receptacle to a user's article of clothing;

said receptacle having sidewalls substantially perpendicular to a plane that is substantially tangential to said article of clothing at the securing point of said receptacle to said article of clothing;

breakaway hinging means for removably connecting said paging receiver to said receptacle and for permitting rotation of said paging receiver away from said tangent

plane, said hinging means being located in part on said paging receiver and in part on said sidewalls; and

breakaway attaching means for removably connecting said paging receiver to said receptacle and for preventing said rotation, said attaching means being located in part on said paging receiver and in part on said sidewalls;



whereby breaking away said attaching means permits rotation of the paging receiver so that the user can observe the information displayed, and breaking away both said hinging means and said attaching means detaches the paging receiver from the receptacle.

4,534,064

FAULT LOCATION ARRANGEMENT FOR DIGITAL OPTICAL TRANSMISSION SYSTEM

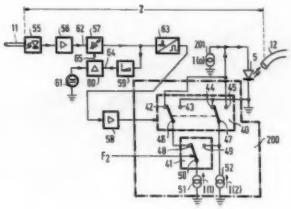
Alberto M. Giacometti, and George W. Newsome, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,324

Claims priority, application Netherlands, Jan. 4, 1982, 8200002

Int. Cl.³ H04B *9/00*

U.S. Cl. 455—601 **5 Claims**



1. In a digital optical transmission system having two terminal stations connected by a series of repeaters in one or both transmission directions, each repeater having an electro-optical converter connected to an ongoing optical transmission path, a fault location system for transmitting by amplitude modulation a fault location signal comprising:

an amplitude modulator at each repeater for generating two amplitude levels in response to said fault location signal for both of the two logic levels carried by the digital optical transmission system, whereby a four-level signal is transmitted over said transmission system which maintains power dissipation of said electro-optical converter substantially constant, avoiding wavelength modulation of the light signal carried by said transmission system.

279,935

MOLDED FISH MEAT PRODUCT

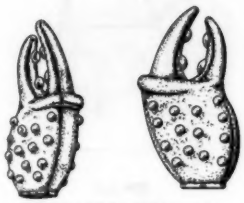
Yoshito Sugino, Nanao, Japan, assignor to Sugiyo Co., Ltd., Ishikawa, Japan

Filed Mar. 11, 1983, Ser. No. 474,510

Claims priority, application Japan, Sep. 27, 1982, 57-44111

Term of patent 14 years

U.S. Cl. D1—111



279,936

SWIMWEAR

Jacquelyn A. Briggery Myles, 1427 Newton Ave., Dayton, Ohio 45406

Continuation-in-part of Ser. No. 374,912, May 4, 1982, Pat. No. Des. 275,810, which is a continuation-in-part of Ser. No. 86,477, Oct. 19, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 431,647

Term of patent 14 years

U.S. Cl. D2—41

279,937

T-SHIRT

Michael Cohen, 34 Myrtle St. #3, Boston, Mass. 02114

Filed Mar. 28, 1983, Ser. No. 479,840

Term of patent 14 years

U.S. Cl. D2—208

279,938

GAUGE FOR USE WITH SEWING AND KNITTING

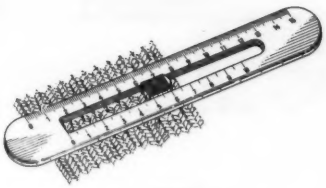
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan

Filed Dec. 20, 1983, Ser. No. 563,530

Claims priority, application Japan, Jun. 30, 1983, 58-28622

Term of patent 14 years

U.S. Cl. D3—18



279,939

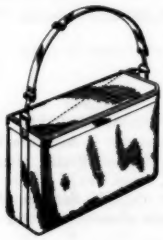
COMBINED MAILBAG AND HOLDER FOR AN UMBRELLA AND DOG REPELLENT CANNISTER

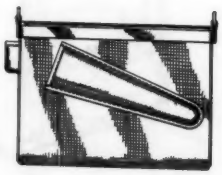
Jack G. Richardson, and Dorothy L. Richardson, both of 5842 Candlewood St., Lakewood, Calif. 90713

Filed Apr. 28, 1983, Ser. No. 489,532

Term of patent 14 years

U.S. Cl. D3—42

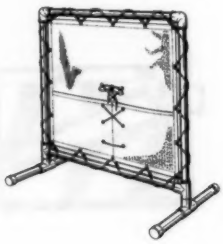




279,940
LUGGAGE ARTICLE FRONT PANEL
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock, Inc., Garfield, N.J.
Division of Ser. No. 240,877, Mar. 5, 1981, abandoned. This application Jan. 19, 1984, Ser. No. 571,833
Term of patent 14 years
U.S. Cl. D3—76

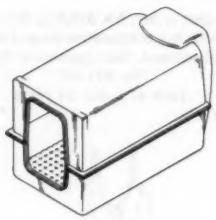
279,941
PROTECTOR FOR TOOTHBRUSH HEAD
Richard T. Anglin, Jr., 698 E. Valleybrook Rd., Blue Springs, Mo. 64015
Filed Aug. 18, 1980, Ser. No. 179,117
Term of patent 14 years
U.S. Cl. D4—199

279,942
ROOM DIVIDER
Julian Vasquez, and Samantha R. Anderson, both of Waco, Tex., assignors to Heart of Texas Region Mental Health Mental Retardation Center, Waco, Tex.
Filed Jan. 19, 1983, Ser. No. 459,261
Term of patent 14 years
U.S. Cl. D6—332

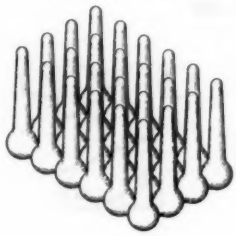


279,943
CHAIR
Richard K. Ogg, Westminster, Md., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed Mar. 9, 1983, Ser. No. 473,727
Term of patent 14 years
U.S. Cl. D6—375

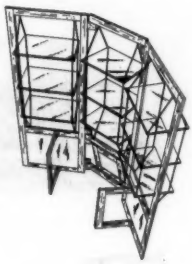
279,944
SLEEPING ENCLOSURE
Charles L. McLaren, 1911 Pear Creek Cir., Houston, Tex. 77084, and Franklin D. Hirsekorn, 105 Rosamond, Houston, Tex. 77076
Filed Aug. 31, 1982, Ser. No. 413,450
Term of patent 14 years
U.S. Cl. D6—382



279,945
MAGAZINE RACK
Walter Zeischegg, Blumenscheinweg 10, Ulm, and Bernd Brüssing, Bilharzstr. 3, Ulm-Lehr, both of Fed. Rep. of Germany (D-7900)
Filed Aug. 24, 1982, Ser. No. 411,232
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1982, MR 954; France, Mar. 16, 1982, DM-001299
The portion of the term of this patent subsequent to May 7, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—449



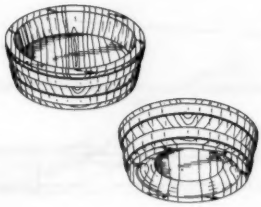
279,946
MERCHANDISE DISPLAY RACK
James O. Willburn, 415 S. 59th St., Tacoma, Wash. 98408
Filed Aug. 25, 1982, Ser. No. 411,289
Term of patent 14 years
U.S. Cl. D6—479



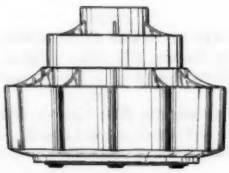
279,947
COMBINED SEAT AND BACKREST UNIT FOR A CHAIR
Luciano Ballarini, Bologna, Italy, assignor to Castelli S.p.A., Bologna, Italy
Filed Apr. 22, 1983, Ser. No. 487,473
Claims priority, application Italy, Oct. 22, 1982, 53841/82[U]
Term of patent 14 years
U.S. Cl. D6—501

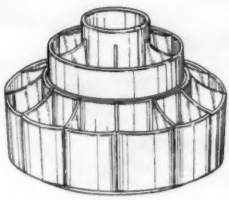
279,948
MUG
Johan H. Weernink, RP Ambt-Delden, Netherlands, assignor to Mepal Service B.V., Kwinkweerd, Netherlands
Filed Feb. 15, 1983, Ser. No. 466,572
Term of patent 14 years
U.S. Cl. D7—9

279,949
FOOD BOWL
Steven J. Rossin, 1701 W. Robb Ave., Lima, Ohio 45805
Filed Jun. 10, 1982, Ser. No. 386,775
Term of patent 14 years
U.S. Cl. D7—23



279,950
REVOLVING HOLDER FOR KITCHEN TOOLS OR THE LIKE
Albert Y. Wan, Kowloon, Hong Kong, assignor to Hung Sang Metal Plastic Factory Ltd., Hong Kong, Hong Kong
Filed Apr. 20, 1983, Ser. No. 486,946
Claims priority, application United Kingdom, Dec. 16, 1982, 1010346
Term of patent 14 years
U.S. Cl. D7—73



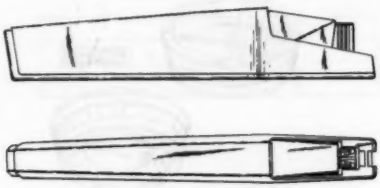


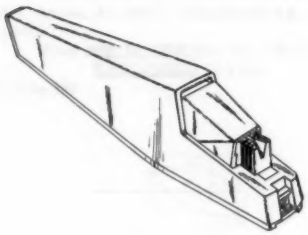
279,951

KNIFE SCABBARD

Frank L. Winyard, Melbourne, Australia, assignor to Wiltshire Consolidated Limited, Australia

Filed Apr. 1, 1983, Ser. No. 481,563
Claims priority, application Australia, Oct. 4, 1982, 1733/82
Term of patent 14 years
U.S. Cl. D7—74





279,952

COVERED FOOD STORAGE CONTAINER OR THE LIKE

Robert H. C. M. Daenen, Hekelgem, Belgium, and Rino Conti, Stoughton, Mass., assignors to Dart Industries Inc., Northbrook, Ill.

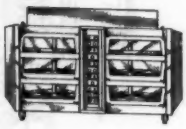
Filed Aug. 10, 1982, Ser. No. 406,849
Term of patent 14 years
U.S. Cl. D7—79

279,953

BAKER'S OVEN

Paul E. Willett, Clontarf, Australia, assignor to Baker Perkins Exports Pty. Ltd., Springvale, Australia

Filed Nov. 9, 1983, Ser. No. 549,913
Claims priority, application Australia, May 31, 1983, 3957/83
Term of patent 14 years
U.S. Cl. D7—338

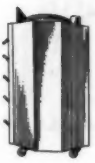


279,954

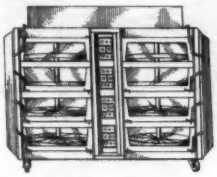
BAKER'S OVEN

Paul E. Willett, Clontarf, Australia, assignor to Baker Perkins Exports Pty. Ltd., Springvale, Australia

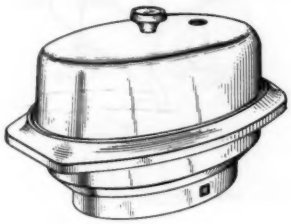
Filed Nov. 9, 1983, Ser. No. 549,914
Claims priority, application Australia, May 31, 1983, 3958/83
Term of patent 14 years
U.S. Cl. D7—338



279,955
BAKER'S OVEN
Paul E. Willett, Clontarf, Australia, assignor to Baker Perkins Export Pty. Ltd., Springvale, Australia
Filed Apr. 19, 1983, Ser. No. 486,431
Claims priority, application Australia, Oct. 26, 1982, 1950/82
Term of patent 14 years
U.S. Cl. D7—348



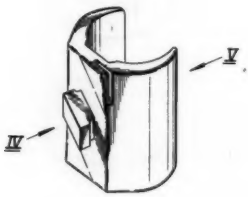
279,956
FOOD STEAMING POT
Richard T. Evck, Wichita, Kans.; Robert W. Fee, Ransom Canyon, Tex.; Richard J. Robbins, Derby, and Shau-Min Liu, Wichita, both of Kans., assignors to Rival Manufacturing Company, Kansas City, Mo.
Filed Mar. 21, 1983, Ser. No. 477,007
Term of patent 14 years
U.S. Cl. D7—354



279,957
DRIVER DRILL
Shumi Akazawa, Fuchu, and Kiyoshi Hoshino, Tokyo, both of Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed Oct. 31, 1983, Ser. No. 546,988
Claims priority, application Japan, May 7, 1983, 58-19173
Term of patent 14 years
U.S. Cl. D8—61

279,958
PLANING TOOL
Michael H. Groves, Warwick, England, assignor to The Stanley Works Limited, Sheffield, England
Filed Jul. 8, 1983, Ser. No. 512,408
Claims priority, application United Kingdom, Jan. 14, 1983, 1010824
Term of patent 14 years
U.S. Cl. D8—90

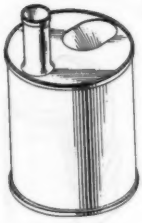
279,959
CLIP
Neil D. Nimmo, Hove; Michael Kenny, and David Willis, both of Kent, all of England, assignors to Nimlok Limited, London, England
Filed Sep. 2, 1983, Ser. No. 529,702
Claims priority, application United Kingdom, Apr. 6, 1983, 1012349
Term of patent 14 years
U.S. Cl. D8—396



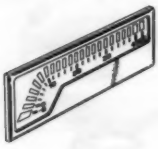
279,960
COMBINED BOTTLE AND CAP
Steve Gavura, Gavura La., Rochester, Pa. 15074
Filed Jan. 17, 1983, Ser. No. 458,481
Term of patent 14 years
U.S. Cl. D9—373

279,961
CONTAINER FOR FLOWABLE PRODUCTS
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed May 12, 1983, Ser. No. 493,833
Term of patent 14 years
U.S. Cl. D9—375

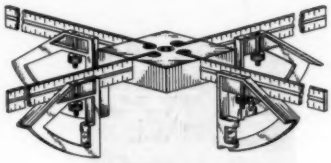
279,962
CONTAINER FOR FLOWABLE PRODUCTS
Vincent E. Fortuna, Huntington Beach, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed May 12, 1983, Ser. No. 493,834
Term of patent 14 years
U.S. Cl. D9—375



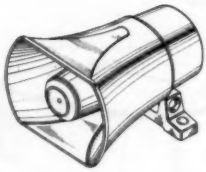
279,963
THERMOMETER FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Jan. 17, 1983, Ser. No. 458,856
Claims priority, application Japan, Sep. 21, 1982, 57-43054
Term of patent 14 years
U.S. Cl. D10—57



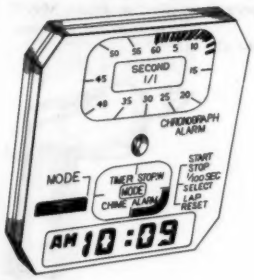
279,964
SQUARING TOOL
Harold R. Weeks, 324 South Findlay, Portage, Ohio 43451
Filed Mar. 21, 1983, Ser. No. 477,346
Term of patent 14 years
U.S. Cl. D10—62



279,965
SIREN
Kazuo Mikami, Matsudo, Japan, assignor to Kobishi Electric Co., Ltd., Japan
Filed Dec. 19, 1983, Ser. No. 562,703
Term of patent 14 years
U.S. Cl. D10—120



279,966
ELECTRO-OPTIC DISPLAY FOR A TIMEPIECE
Hayao Kano, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Jan. 29, 1982, Ser. No. 343,968
Claims priority, application Japan, Oct. 31, 1981, 56-48770
Term of patent 14 years
U.S. Cl. D10—125



279,967
FIGURINE OF A WATER BUFFALO
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Apr. 30, 1982, Ser. No. 373,670
Term of patent 14 years
U.S. Cl. D11—158

279,968
FIGURINE OF A LEMUR MONKEY
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jan. 17, 1983, Ser. No. 458,295
Term of patent 14 years
U.S. Cl. D11—158

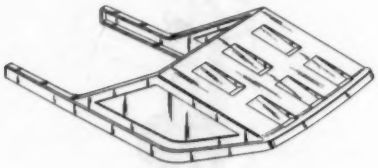
279,969
FIGURINE OF A BIG HORN SHEEP
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jan. 17, 1983, Ser. No. 458,302
Term of patent 14 years
U.S. Cl. D11—158

279,970
FIGURINE OF AN OSTRICH
Jesus A. Carbajales Santa-Eulalia, and Javier B. Carbajales Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.
Filed Jun. 17, 1982, Ser. No. 389,542
Term of patent 14 years
U.S. Cl. D11—162

279,971
TIRE
Bill J. Wallet, Marshallville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Filed May 20, 1983, Ser. No. 496,723
Term of patent 14 years
U.S. Cl. D12—147

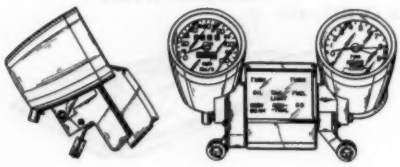
279,972
CAR TOP CARRIER
John R. Marovich, 1564 Welling, Troy, Mich. 48098
Filed Aug. 31, 1983, Ser. No. 528,038
Term of patent 14 years
U.S. Cl. D12—157

279,973
MOTORCYCLE RACK
Ronald H. Powers, Newport Beach, Calif., assignor to Creative Powers, Inc., Newport Beach, Calif.
Filed Dec. 15, 1981, Ser. No. 330,887
Term of patent 14 years
U.S. Cl. D12—158



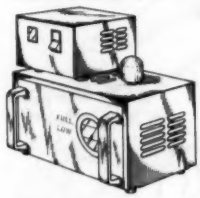
279,974
FRONT FENDER FOR MOTORCYCLE
Masamichi Komori, Sayama; Kazuhiko Tsunoda, Kamifukuoka, and Yasuyuki Tsurumi, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Aug. 16, 1982, Ser. No. 408,706
Claims priority, application Japan, Feb. 22, 1982, 57-7265
Term of patent 14 years
U.S. Cl. D12—186

279,975
MOTORCYCLE INSTRUMENT CLUSTER
Nakamura Akira, Tokyo, and Yamada Toshiyuki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Dec. 16, 1982, Ser. No. 450,451
Claims priority, application Japan, Jun. 22, 1982, 57-28088
Term of patent 14 years
U.S. Cl. D12—192

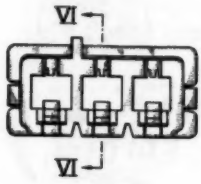


279,976
MOTORCYCLE DISPLAY PANEL AND SUPPORT FOR INSTRUMENT GAUGES
Nakamura Akira, Tokyo, and Yamada Toshiyuki, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Dec. 16, 1982, Ser. No. 450,452
Claims priority, application Japan, Jun. 22, 1982, 57-28089
Term of patent 14 years
U.S. Cl. D12—192

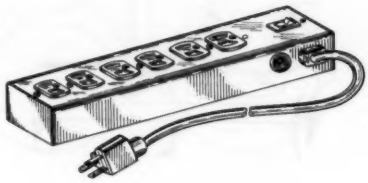
279,977
GENERATOR FOR FUEL ADDITIVE
William F. Bonazelli, P.O. Box 208, Hathaway Pines, Calif. 95233
Filed Jul. 12, 1983, Ser. No. 513,196
Term of patent 14 years
U.S. Cl. D13—2



279,978
CONNECTOR HOUSING
Nori Inoue; Yoshio Itou, both of Yokkaichi, and Atsushi Sakatani, Matsuzaka, all of Japan, assignors to Tokai Electric Wire Co., Ltd., Japan
Filed Dec. 27, 1982, Ser. No. 452,890
Claims priority, application Japan, Jun. 29, 1982, 57-29112; Jun. 29, 1982, 57-29113
Term of patent 14 years
U.S. Cl. D13—24

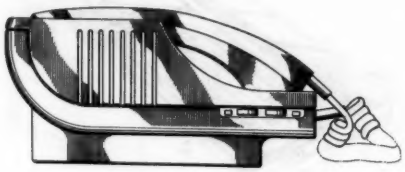


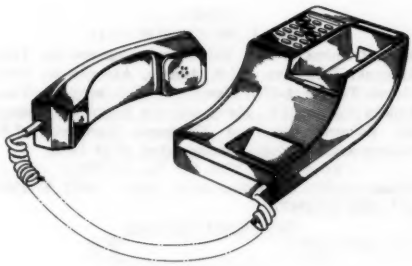
279,979
MULTIPLE OUTLET STRIP
James D. Kovacik, Parma; Thomas J. Blanch, Maple Heights; Paul S. Blanch, Garfield Heights, and James W. Kovacik, Parma, all of Ohio, assignors to Alert Safety Lite Products Co., Bedford Heights, Ohio
Filed Sep. 30, 1982, Ser. No. 431,748
Term of patent 14 years
U.S. Cl. D13—30



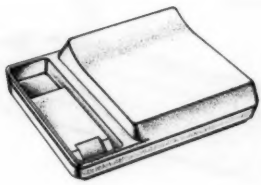
279,980
TELEPHONE STAND
Paul E. Tremblay, 20 Dow St., Salem, Mass. 01970
Filed May 18, 1983, Ser. No. 496,624
Term of patent 14 years
U.S. Cl. D14—62

279,981
MOBILE TELEPHONE UNIT
Masakazu Tsukamoto, Funabashi, and Kiyoshi Ishii, Hachioji, both of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Sep. 28, 1982, Ser. No. 425,690
Claims priority, application Japan, Mar. 31, 1982, 57-13519
Term of patent 14 years
U.S. Cl. D14—53





279,982
TELEPHONE STAND
Donald M. Genaro, Haworth, N.J.; Daniel K. Harden, Brooklyn, N.Y., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.
Filed Sep. 20, 1984, Ser. No. 653,371
Term of patent 14 years
U.S. Cl. D14—60



279,983

PERSONAL COLOR COMPUTER

Gary E. Grimes, Watertown, Conn., assignor to Timex Computer Corporation, Waterbury, Conn.

Filed Jun. 2, 1983, Ser. No. 500,609

Term of patent 14 years

U.S. Cl. D14—100

279,984

CENTRAL PROCESSOR UNIT

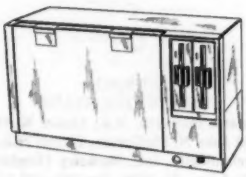
Mitsuru Ohnuma, 1-40-1, Shimoigusa, Suginami-ku, Tokyo; Kazuyuki Tsuburaya, 757-8, Amema, Akigawa-shi, Tokyo; Masato Tanitsu, 1-40-1, Hyoshi-cho, Kokubunji-shi, Tokyo; Akihito Nakata, 1021, Harajyuku-cho, Totsuko, Yokohama-shi, Kanagawa-ken, and Hidetomo Yoshimura, 7-9-5, Sakurayama, Zushi-shi, Kanagawa-ken, all of Japan

Filed May 4, 1983, Ser. No. 491,589

Claims priority, application Japan, May 7, 1982, 57-19471; May 7, 1982, 57-19472

Term of patent 14 years

U.S. Cl. D14—109



279,985

PRINTER

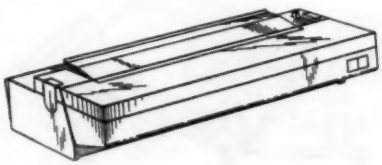
Richard S. Thom, London, England, assignor to Prutec Limited, London, England

Filed Aug. 3, 1982, Ser. No. 404,927

Claims priority, application United Kingdom, Feb. 10, 1982, 1005032

Term of patent 14 years

U.S. Cl. D14—111



279,986

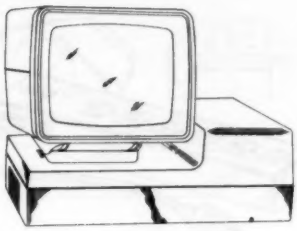
DISPLAY STATION FOR A DATA PROCESSING SYSTEM

Peter J. Mendel, Rochester, Minn.; Frank Wilkey, Jr. deceased, late of Rochester, Minn., and First National Bank Of Rochester, Executor, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,798

Term of patent 14 years

U.S. Cl. D14—113



279,987

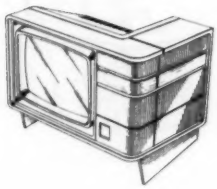
DISPLAY CABINET FOR CRT

Nuccio Bertone, Turin, Italy, assignor to Northern Technologies Limited, Markham, Canada

Filed May 11, 1983, Ser. No. 493,483

Term of patent 14 years

U.S. Cl. D14—113



279,988

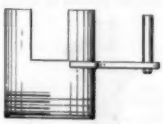
SELF-ALIGNING DIE HOLDER

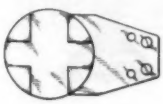
Lee W. Richards, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Sep. 30, 1982, Ser. No. 429,751

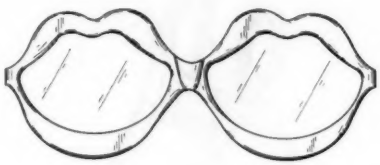
Term of patent 14 years

U.S. Cl. D15—140



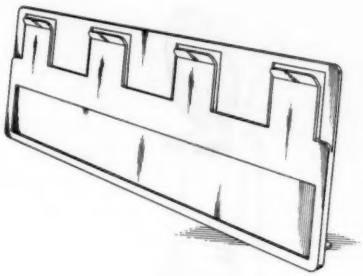


279,989
SUNGLASSES
Paul McNaughton, 1828 Lake Dr., Winston Salem, N.C. 27107
Filed Mar. 14, 1984, Ser. No. 589,574
Term of patent 14 years
U.S. Cl. D16—104

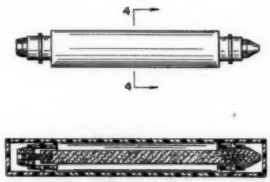


279,990
TRANSPARENT ENVELOPE
Ernst W. Gerber, c/o E. Gerber Products, Inc., P.O. Box E, Center Lovell, Me. 04016
Filed Jul. 6, 1982, Ser. No. 395,811
Term of patent 14 years
U.S. Cl. D19—3

279,991
NOTE HOLDER STAND FOR CALENDARS AND DOCUMENTS
Andrew S. Lehman, 960 Bellmore Ave., North Bellmore, N.Y. 11710
Filed Sep. 29, 1982, Ser. No. 430,261
Term of patent 14 years
U.S. Cl. D19—21



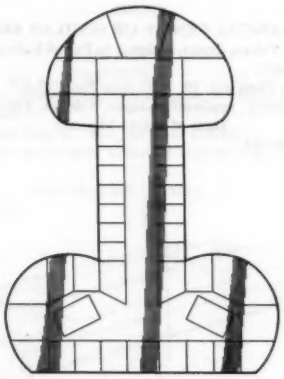
279,992
DUAL TIP MARKING INSTRUMENT
Stephen R. Gribb, 10846 Seavitt Dr., Allen Park, Mich. 48101
Filed Apr. 6, 1983, Ser. No. 482,563
Term of patent 14 years
U.S. Cl. D19—43



279,993
MECHANICAL PENCIL OR SIMILAR ARTICLE
Shigeo Oka, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 19, 1983, Ser. No. 515,367
Claims priority, application Japan, Feb. 15, 1983, 58-5754
Term of patent 14 years
U.S. Cl. D19—45

279,994
PAPERWEIGHT
Paul Noll, Manchester, Calif., assignor to Lieba, Inc., Baltimore, Md.
Filed Jan. 26, 1983, Ser. No. 461,236
Term of patent 14 years
U.S. Cl. D19—97

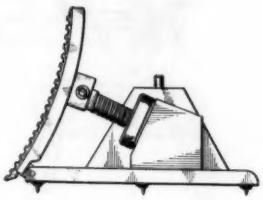
279,995
GAMEBOARD
Robert G. Veihl, Jr., 819 Kelly Ave., Joliet, Ill. 60435; Mart J. Dickinson, and H. Wade Dickinson, both of 8 N. Park Rd., Joliet, Ill. 60433
Filed Sep. 20, 1982, Ser. No. 420,470
Term of patent 14 years
U.S. Cl. D21—33



279,996
PUCK
Michael W. Survance, 12312 Brookgreen Dr., Louisville, Ky. 40243, and John D. Survance, 8103 Four Winds Dr., Louisville, Ky. 40222
Filed Sep. 20, 1982, Ser. No. 420,374
Term of patent 14 years
U.S. Cl. D21—51

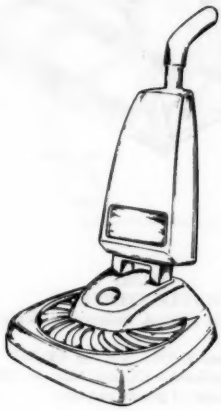
279,997
STILT
James N. Brown, P.O. Box 697, Seminole, Okla. 74868, and Darrell L. Taylor, P.O. Box 925, Orange, Tex. 77630
Filed Mar. 15, 1983, Ser. No. 475,398
Term of patent 14 years
U.S. Cl. D21—72

279,998
FOOT SUPPORT BLOCK FOR RUNNER'S STARTING BLOCK ASSEMBLY
Milton A. Newton, Jr., 4392 Pampas Rd., Woodland Hills, Calif. 91364
Filed Jun. 29, 1983, Ser. No. 510,090
Term of patent 14 years
U.S. Cl. D21—199

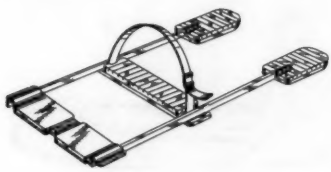


279,999
GOLF CLUB HEAD COVER
James H. Menath, 800 W. Washington, Carson City, Nev. 89701
Filed Mar. 4, 1983, Ser. No. 472,050
Term of patent 14 years
U.S. Cl. D21—221

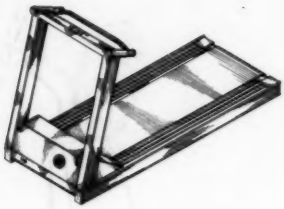
280,000
TOY VACUUM CLEANER
Ronald R. Klawitter, Hermann, Mo., assignor to Handi-Pac, Inc., Hermann, Mo.
Filed Jan. 3, 1983, Ser. No. 455,104
Term of patent 14 years
U.S. Cl. D21—122



280,001
EXERCISE FRAME
James R. Noble, Mountain Rd., Henderson R.D. 1, Auckland, New Zealand
Filed Sep. 21, 1982, Ser. No. 420,920
Claims priority, application New Zealand, Apr. 30, 1982, 200465
Term of patent 14 years
U.S. Cl. D21—191

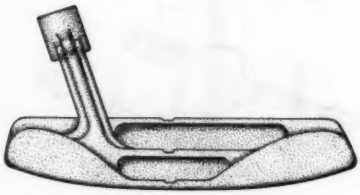


280,002
TREADMILL
David B. Smith, Mercer Island, Wash., assignor to Precor Incorporated, Redmond, Wash.
Filed Apr. 14, 1983, Ser. No. 484,908
Term of patent 14 years
U.S. Cl. D21—192

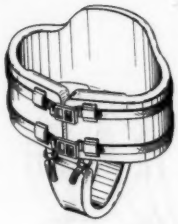


280,003
BICYCLE EXERCISER
Heikki Kiiski, Turku, Finland, assignor to Tunturipyörä Oy, Finland
Filed Sep. 9, 1983, Ser. No. 530,745
Claims priority, application Finland, Mar. 17, 1983, 260/83
Term of patent 14 years
U.S. Cl. D21—194

280,004
PUTTER HEAD
John A. Worster, Solana Beach, Calif.; Charles G. Giebel, Phoenix, Ariz., and Herbert W. Lyon, Escondido, Calif., assignors to Acushnet Company, New Bedford, Mass.
Filed Jan. 13, 1983, Ser. No. 457,722
Term of patent 14 years
U.S. Cl. D21—219

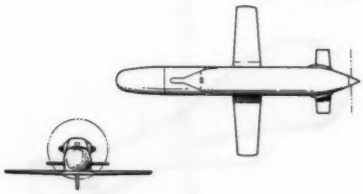


280,005
BUOYANT BELT
Robert S. Jones, 8456 Rodney Dr., Indianapolis, Ind. 46234
Filed Sep. 14, 1983, Ser. No. 531,953
Term of patent 14 years
U.S. Cl. D21—238

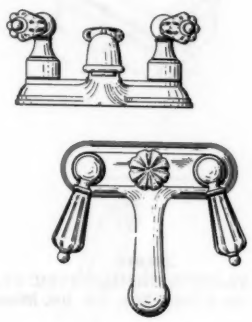


280,006
GRIP PLATE FOR A GUN
Raymond J. Dheur, Cheratte, Belgium, assignor to Fabrique Nationale Herstal S.A., Belgium
Filed Feb. 18, 1982, Ser. No. 349,701
Term of patent 14 years
U.S. Cl. D22—7

280,007
UNMANNED AIRCRAFT
Chris Benneche; Richard W. Cronin, both of Newbury Park; Eugene M. Linhart, Thousand Oaks; Richard L. Ranes, Simi Valley, and Darrell K. Welch, Thousand Oaks, all of Calif., assignors to Northrop Corporation, Hawthorne, Calif.
Filed Jan. 10, 1980, Ser. No. 110,825
Term of patent 14 years
U.S. Cl. D22—11

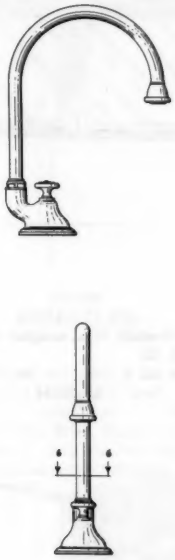


280,008
FAUCET
Charles D. Miller; Bernard O. Daniels, and William C. McKeone, all of Kansas City, Mo., assignors to Broadway Industries, Inc., Kansas City, Mo.
Filed Oct. 3, 1983, Ser. No. 538,212
Term of patent 14 years
U.S. Cl. D23—25

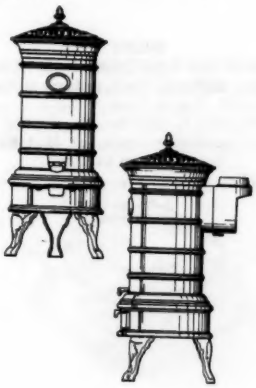


280,009
FAUCET SET
Charles D. Miller; Bernard O. Daniels, and William C. McKeone, all of Kansas City, Mo., assignors to Broadway Industries, Inc., Kansas City, Mo.
Filed Oct. 3, 1983, Ser. No. 538,224
Term of patent 14 years
U.S. Cl. D23—25

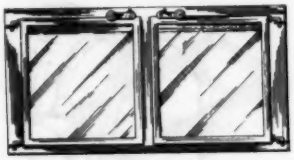
280,010
SPOUT
Charles D. Miller; Bernard O. Daniels, and William C. McKeone, all of Kansas City, Mo., assignors to Broadway Industries, Inc., Kansas City, Mo.
Filed Apr. 2, 1984, Ser. No. 595,648
Term of patent 14 years
U.S. Cl. D23—32



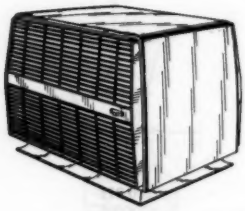
280,011
STOVE
Oreste G. Nosenzo, Asti, Italy, assignor to C. S. di Nosenzo Oreste, Asti, Italy
Filed Dec. 7, 1982, Ser. No. 447,583
Term of patent 14 years
U.S. Cl. D23—97



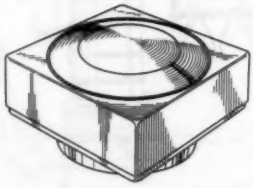
280,012
FIREPLACE DOOR
Donald W. Wilkening, Akeley, assignor to Wilkening Manufacturing Company, Walker, Minn.
Filed May 5, 1983, Ser. No. 491,714
Term of patent 14 years
U.S. Cl. D23—128



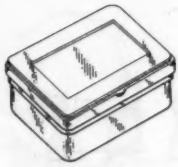
280,013
AIR CLEANER
Alfred W. Madl, Glendale, Wis., assignor to Sunbeam Corporation, Oak Brook, Ill.
Filed Jul. 8, 1983, Ser. No. 512,211
Term of patent 14 years
U.S. Cl. D23—149



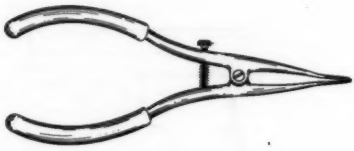
280,014
AIR FRESHENER DISPENSER FOR VEHICLES
Yoshihisa Tanaka, Ichikawa, Japan, assignor to Tanaka Manufacturing Co., Ltd., Tokyo, Japan
Filed Nov. 8, 1983, Ser. No. 550,010
Claims priority, application Japan, Jul. 25, 1983, 58-32634
Term of patent 14 years
U.S. Cl. D23—150



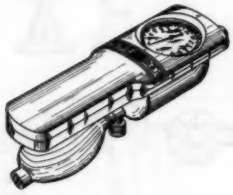
280,015
DENTAL WORK CASE
Armen G. Sarajian, 1624 Ridgeway Dr., Glendale, Calif. 91202
Filed Apr. 5, 1982, Ser. No. 365,627
Term of patent 14 years
U.S. Cl. D24—10



280,016
MODULE PLACING ORTHODONTIC PLIERS
Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291
Filed Sep. 20, 1982, Ser. No. 420,398
Term of patent 14 years
U.S. Cl. D24—10



280,017
BLOOD PRESSURE METER
Murray I. C. Camens, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 20, 1982, Ser. No. 420,207
Claims priority, application Japan, Mar. 24, 1982, 12.173
Term of patent 14 years
U.S. Cl. D24—17



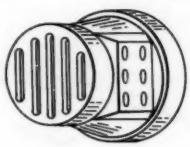
280,018
SYRINGE LOADING GUIDE
Peter K. Scott, Waban, Mass., assignor to Commonwealth Industries, Boston, Mass.
Filed Oct. 25, 1982, Ser. No. 436,564
Term of patent 14 years
U.S. Cl. D24—25

280,019
STAPLE REMOVER
Robert P. Meyer, Creve Coeur Township, St. Louis County, Mo., and Leland W. Annett, Lake Elmo, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Aug. 17, 1983, Ser. No. 524,093
Term of patent 14 years
U.S. Cl. D24—26

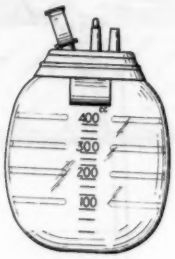
280,020
HIP JOINT PROSTHESIS
Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024
Filed Apr. 19, 1982, Ser. No. 369,732
Term of patent 14 years
U.S. Cl. D24—33

280,021
AIRWAY
Bruce Rind, 104-40 Queens Blvd., Forest Hills, N.Y. 11375
Filed Jun. 7, 1982, Ser. No. 386,164
Term of patent 14 years
U.S. Cl. D24—34

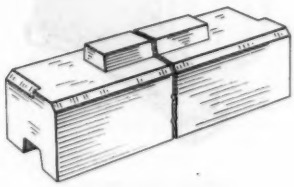
280,022
HEARING AID TRANSDUCER OR THE LIKE
Philip S. Egan, Fairfax; Keld T. Helmuth, Novato; Richard G. Pimentel, San Rafael, all of Calif., and Tom B. Soerensen, Praestoe, Denmark, assignors to Phonic Ear, Inc., Mill Valley, Calif.
Filed Mar. 10, 1983, Ser. No. 474,245
Term of patent 14 years
U.S. Cl. D24—35



280,023
WOUND DRAINAGE RESERVOIR
Matthew W. Bootman, Goleta; Peter Schillke, Santa Barbara, and Stephen W. Laguette, Santa Barbara, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Aug. 19, 1982, Ser. No. 410,181
Term of patent 14 years
U.S. Cl. D24—56

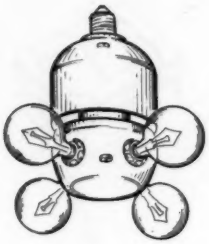


280,024
STRETCHER FOR CRIBBING
Angelo Risi, and Antonio Risi, both of P.O. Box 370, Gormley, Ontario, Canada L0H 1G0
Filed Sep. 8, 1982, Ser. No. 398,291
Claims priority, application Canada, Jun. 24, 1982, 24-06-82-1
Term of patent 14 years
U.S. Cl. D25—80



280,025
FLAME-PROOF LIGHT ENCLOSURE
Ivan L. Waters, Yarra Glen, Australia, assignor to Burn-Brite Lights Proprietary Limited, Victoria, Australia
Filed Dec. 17, 1982, Ser. No. 450,762
Claims priority, application Australia, Sep. 1, 1982, 1452/82
Term of patent 14 years
U.S. Cl. D26—24

280,026
ROTATING LIGHT
Irol G. Gangbin, 3 Via Barberini, Chula Vista, Calif. 92010
Filed Dec. 15, 1982, Ser. No. 450,146
Term of patent 14 years
U.S. Cl. D26—26



280,027
LANTERN
Tor H. Petterson, Palos Verdes Peninsula, Calif., assignor to Rayovac Corporation, Madison, Wis.
Filed Aug. 4, 1983, Ser. No. 520,323
Term of patent 14 years
U.S. Cl. D26—40

280,028
FLASHLIGHT
Tor H. Petterson, Rancho Palos Verdes, Calif., assignor to Rayovac Corporation, Madison, Wis.
Filed Jun. 24, 1983, Ser. No. 507,515
Term of patent 14 years
U.S. Cl. D26—49

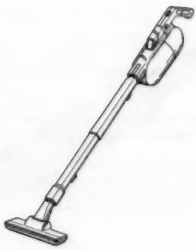
280,029
LANTERN
Tor H. Petterson, Palos Verdes Peninsula, Calif., assignor to Rayovac Corporation, Madison, Wis.
Filed Jul. 25, 1983, Ser. No. 516,724
Term of patent 14 years
U.S. Cl. D26—50

280,030
BALANCED LIGHT FOR DRAFTING TABLES
Charles Matthews, San Clemente, Calif., assignor to Plan Hold Corporation, Irvine, Calif.
Filed Dec. 7, 1982, Ser. No. 447,479
Term of patent 14 years
U.S. Cl. D26—60

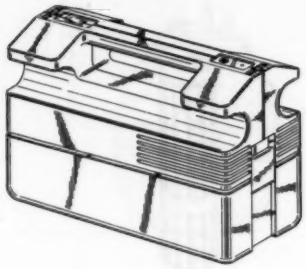
280,031
HAIR CURLER
Edward J. Doyle, Hatboro, Pa., and James M. Rittenhouse, Watchung, N.J., assignors to Conair Corporation, Edison, N.J.
Filed Mar. 28, 1983, Ser. No. 479,264
Term of patent 14 years
U.S. Cl. D28—35

280,032
LIPSTICK CONTAINER
Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Aug. 13, 1983, Ser. No. 528,086
Term of patent 14 years
U.S. Cl. D28—89

280,033
VACUUM CLEANER
Isshin Miyamoto; Yasuo Nagamatsu; Toshiya Moriyama, and Masaharu Sakamoto, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 9, 1983, Ser. No. 530,828
Claims priority, application Japan, Mar. 10, 1983, 58-9911
Term of patent 14 years
U.S. Cl. D32—22

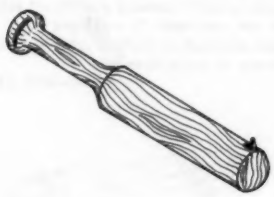


280,034
PORTABLE VACUUM CLEANER
Horst Pudwill, Kowloon, Kong, assignor to Continental Engineering Products Co., Ltd., Kowloon, Hong Kong
Filed Jun. 10, 1983, Ser. No. 503,364
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1982, 1449/82
Term of patent 14 years
U.S. Cl. D32—24



280,035
BASKET
Evonne Mitchell, 5088 Woodcliff, Flint, Mich. 48504
Filed Mar. 17, 1983, Ser. No. 476,122
Term of patent 14 years
U.S. Cl. D32—37

280,036
BOOT CLEANING DEVICE
Gary R. Ulman, Box 55, Thetford Center, Vt. 05075
Filed Sep. 20, 1983, Ser. No. 533,992
Term of patent 14 years
U.S. Cl. D32—47



280,037
FINISH REMOVER
James S. Smith, R.D. #2, Box 228, Ligonier, Pa. 15658
Filed Nov. 22, 1982, Ser. No. 443,379
Term of patent 14 years
U.S. Cl. D32—49

280,038
CONTAINER
George C. Anderson, Mount Prospect, Ill., assignor to Insilco Corporation, Wheeling, Ill.
Filed Oct. 12, 1982, Ser. No. 433,945
The portion of the term of this patent subsequent to Apr. 23, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—53

280,039
FOLDABLE GROCERY CART
Jerry L. Strayer, Rte. #8, Box 241, Rangeline Rd. South, Road 300 West, Muncie, Ind. 47302
Filed Jun. 16, 1982, Ser. No. 384,795
Term of patent 14 years
U.S. Cl. D34—24

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Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, 4,533,755, Cl. 568-454.000.

Back, Gunter, to Hoechst Aktiengesellschaft. Positioning device for an exposing and developing apparatus. 4,533,239, Cl. 355-72.000.

Baehrle, Friedrich: *See*—
Wulf, Helmut; and Baehrle, Friedrich, 4,532,894, Cl. 123-142.50E.

Baeslack, Bernd: *See*—
Kratzenberg, Wolfgang; and Baeslack, Bernd, 4,533,327, Cl. 434-20.000.

Bagde-A-Minit Ltd.: *See*—
Roebuck, Malcolm J., 4,532,684, Cl. 29-4.000.

Bailey, Peter J.: *See*—
Smith, Alan; and Bailey, Peter J., 4,533,632, Cl. 435-47.000.

Bailey, Thomas F.; Campbell, John E.; Rives, Allen K.; and Shah, Nehal M., to A-Z International Company. Drilling apparatus and cutter therefor. 4,533,003, Cl. 175-269.000.

Bake, Louis S., Jr. Cushioned container. 4,533,050, Cl. 206-545.000.

Baker, Alan J.; and Leiby, Robert W. Precision angle transducer using nonprecision rotors. 4,533,902, Cl. 340-347.00P.

Baker, Edward H.; and King, George R. Restraining belts. 4,532,681, Cl. 403-28.000.

Baker, Michael E.; and Baker, Thomas M., to Boeing Company, The. High lift system control assembly. 4,533,096, Cl. 244-75.00R.

Baker, Thomas M.: *See*—
Baker, Michael E.; and Baker, Thomas M., 4,533,096, Cl. 244-75.00R.

Bakish Materials Corp.: *See*—
Neumann, Manfred; Morgner, Henry; Forster, Harry; Jasch, Gunter; Kunack, Wilfried; Godenschweg, Martin; and Unganz, Peter, 4,532,888, Cl. 118-718.000.

Bakker, Harry J.: *See*—
Feikema, Roger H.; and Bakker, Harry J., 4,532,998, Cl. 172-15.000.

Balakrishnan, Ramanatha V., to National Semiconductor Corporation. Current limiting circuit for high current peripheral drivers. 4,533,839, Cl. 307-270.000.

Balazs, Laszlone : *See*—
Muranyi, Istvan; Balazs, Laszlone ; Molnar, Jozsef; Burda, Ferencne ; Metzler, Maria; and Szerdahelyi, Lajos, 4,533,638, Cl. 435-288.000.

Balko, Edward N.; and Moulthrop, Lawrence C., to Oronzio de Nora Impianti Elettrochimici S.p.A. Bipolar separator plate for electrochemical cells. 4,533,455, Cl. 204-279.000.

Ball Corporation: *See*—
Woolley, Richard P., 4,532,803, Cl. 73-471.000.

Ball, William J.; Barri, Sami A. I.; and Young, Dennis, to British Petroleum Company p.l.c., The. Method of preparing crystalline aluminosilicates. 4,533,649, Cl. 502-71.000.

Baltimore Spice Company, The: *See*—
Hershfeld, Robert R., 4,532,858, Cl. 99-534.000.

Ban, Thomas E. Storage container for paint applicators. 4,533,044, Cl. 206-362.000.

Ban, Yuzaburoh: *See*—
Ogura, Mototsugu; Ban, Yuzaburoh; and Hase, Nobuyasu, 4,533,410, Cl. 148-175.000.

Bangs, Richard G., to NCR Corporation. Process preventing air bubble lock in ink jet nozzles. 4,533,569, Cl. 427-154.000.

Banich, John N.: *See*—
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.

Banks, Dennis G.: *See*—
Banks, Joseph R.; and Banks, Dennis G., 4,533,170, Cl. 296-78.00A.

Banks, Joseph R.; and Banks, Dennis G. Stroller cover and support frame therefor. 4,533,170, Cl. 296-78.00A.

Bannister, Brian C., to Marler Haley Exposystems Ltd. Barrier system. 4,533,122, Cl. 256-69.000.

Barber-Colman Company: *See*—
Fermanich, Raymond J., 4,532,951, Cl. 137-84.000.
Parsons, Gerald R., 4,533,800, Cl. 200-61.390.

Bark, Jeffrey E., to Medical Engineering Corporation. Skin mounted drainage catheter retention disc. 4,533,349, Cl. 604-174.000.

Barker, James M., to Otis Engineering Corp. Valved plug for packer. 4,532,989, Cl. 166-188.000.

Barker, Laurence S., to Xerox Corporation. Jammed sheet removal aid in a reproducing machine. 4,533,135, Cl. 271-275.000.

Barker, Peter L.: *See*—
Biftu, Tesfaye; Witzel, Bruce E.; and Barker, Peter L., 4,533,671, Cl. 514-413.000.

Barnett, Larry R.: *See*—
Lau, Yue-Ying; Chu, Kwo R.; Granatstein, Victor L.; and Barnett, Larry R., 4,533,875, Cl. 330-4.000.

Barney, Charlotte L.: *See*—
Wagner, Eugene R.; Barney, Charlotte L.; and Matthews, Donald P., 4,533,677, Cl. 514-638.000.

Baron, Kenneth S.: *See*—
Lee, Frank W. C.; and Baron, Kenneth S., 4,533,715, Cl. 528-45.000.

Barri, Sami A. I.: *See*—
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Barritault, Denis: *See*—
Guedon born Saglier, Isabelle; Barritault, Denis; Courtois, Yves; Arruti, Cristina; and Prunieras, Michel, 4,533,635, Cl. 435-240.000.

Basey, Gene, to Basey, Gene. Variable pitch stair railing assembly. 4,533,121, Cl. 256-67.000.

BASF Aktiengesellschaft: *See*—
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, 4,533,612, Cl. 430-59.000.
Kummer, Rudolf; Richter, Wolfgang; Schwirten, Kurt; and Stops, Peter, 4,533,757, Cl. 568-454.000.

BASF Wyandotte Corporation: *See*—
Schmidt, Douglass N.; Finnan, Jeffrey L.; and Lisa, Rudolph E., 4,533,674, Cl. 514-474.000.

Bassett, David A. Rotor system for horizontal axis wind turbines. 4,533,297, Cl. 416-132.00B.

Bassett, Neville C.: *See*—
Ensor, Paul M. D.; and Bassett, Neville C., 4,533,468, Cl. 209-172.000.

Bastion, Patrick; Lhuillier, Francois; and Mutschler, Ulrich, to Societe Staubli-Verdol. Weaving mechanism with improved selection of the hooks. 4,532,963, Cl. 139-59.000.

Battenfeld Maschinenfabrik GmbH: *See*—
Feist, Norbert, 4,533,521, Cl. 422-133.000.

Battle, Billy J.; and Jones, Lawrence S., to United States Pipe and Foundry Company. Guides for gate valves. 4,532,957, Cl. 137-375.000.

Batty, John R., Jr., to Cordis Corporation. Implant communication system with frequency shift means. 4,532,932, Cl. 128-631.000.

Bauer, Helmut: *See*—
Krob, Erwin; and Bauer, Helmut, 4,533,155, Cl. 280-628.000.

Bauer, Robert K.: *See*—
McNamara, Robert P.; Ennis, Gregory B.; Feiertag, Richard J.; and Bauer, Robert K., 4,533,948, Cl. 358-122.000.

Bauer, Siegfried: *See*—
Stockburger, Hermann; Winderlich, Hans-George; Bauer, Siegfried; and Adamovic, Zeljko H., 4,533,237, Cl. 355-40.000.

Baugh, Robert F.; Braun, Walter J.; and Cooper, Daniel, to HemoTec, Inc. Gas flow coagulation test cartridge having movable member establishing communication between reagent and reaction chambers. 4,533,519, Cl. 422-73.000.

Baukol, David E.; and Dorsey-Palmateer, John W., to Boeing Company, The. Method for testing multi-section photo-sensitive detectors. 4,533,870, Cl. 324-158.00D.

Baumann, Rainer, to Honeywell, Inc. Ring laser gyroscope. 4,533,248, Cl. 356-350.000.

Baumhauer, John C., Jr.; Hershey, Harold J.; and Poteat, Tommy L., to American Telephone and Telegraph; and AT&T Bell Laboratories. Integrated electroacoustic transducer. 4,533,795, Cl. 179-111.00E.

Bavoux, Guy; and Dallaserra, Arthur B., to Herve Et Fils, S.A. Method and apparatus for controlling the temperature in rotating printers. 4,532,863, Cl. 101-153.000.

Bayer Aktiengesellschaft: *See*—
Baasner, Bernd; Hagemann, Hermann; and Klauke, Erich, 4,533,776, Cl. 568-946.000.
Freitag, Dieter; Bottenbruch, Ludwig; and Schmidt, Manfred, 4,533,702, Cl. 525-439.000.
Goldmann, Gerd; Spott, Georg; and Frohlich, Christian, 4,533,432, Cl. 159-47.100.
Marhold, Albrecht; and Klauke, Erich, 4,533,777, Cl. 570-144.000.
Muschelknautz, Edgar; Rink, Norbert; and Chalupka, George, 4,533,376, Cl. 65-5.000.
Sirrenberg, Wilhelm; Klauke, Erich; and Hammann, Ingeborg, 4,533,676, Cl. 514-535.000.
Waniczek, Helmut; Uerdingen, Walter; and Brudermanns, Karola, 4,533,728, Cl. 528-370.000.
Wingler, Frank; Waniczek, Helmut; and Geyer, Otto-Christian, 4,533,397, Cl. 106-181.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,533,900, Cl. 340-52.00R.

Bayusik, John G.: *See*—
Scardera, Michael; and Bayusik, John G., 4,533,486, Cl. 252-156.000.

Beal, Walter: *See*—
Hickman, Alvin E., 4,532,988, Cl. 166-176.000.

Beatovic, George S.: *See*—
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.

Beauprey, Richard R., to Disc Instruments, Inc. Optical encoder with a shutter clutched for directional movement. 4,533,830, Cl. 250-231.05E.

Beckmann, Manfred: *See*—
Dittmar, Heinz; Beckmann, Manfred; Dorr, Karl-Heinz; Rothe, Ulrich; and Sander, Ulrich, 4,533,537, Cl. 423-522.000.

Beckwith, Sterling. Control apparatus for hydraulically driven generator. 4,533,835, Cl. 290-43.000.

Beecham Group p.l.c.: *See*—
Blaney, Francis E.; Hadley, Michael S.; King, Francis D.; and Watts, Eric A., 4,533,498, Cl. 260-243.300.

Begley, Benjamin D., to Eaton Corporation. Gerotor motor and improved lubrication flow circuit therefor. 4,533,302, Cl. 418-61.00B.

Beim, Rudolf, to Ford Motor Company. Dual power transmission for tractor vehicles. 4,532,827, Cl. 74-745.000.

Beisel, Victor A. Grass seed from stem remover. 4,533,469, Cl. 209-243.000.

Bell, David R.; and Miller, Theodore E., Jr., to Dow Chemical Company, The. Method for the batch preparation of sample aliquots by solvent extraction and separation of solubles from nonsoluble particulate. 4,533,643, Cl. 436-178.000.

Bell, George M., to Stavis, Hillel. Infinitely adjustable support system. 4,533,104, Cl. 248-245.000.

Bell & Howell Company: *See*—
Hams, Kenneth A., 4,533,133, Cl. 271-9.000.

Bellasalma, Gerald J.: *See*—
Altman, Murray; and Bellasalma, Gerald J., 4,533,512, Cl. 264-339.000.

Beller, Wilbert E.; Georgacakis, George D.; and Obermann, George, to Singer Company, The. Switch construction. 4,533,803, Cl. 200-153.00K.

Belopolsky, Yakov, to Northern Telecom Limited. Fuse for thick film device. 4,533,896, Cl. 337-232.000.

Benedict, Gary F., to Garrett Corporation, The. Method and apparatus for laser hardening of steel. 4,533,400, Cl. 148-4.000.

Beneze, Heinz W.; and Tomaszewski, Walter, to Firestone Tire & Rubber Company, The. Locking device for membrane fastener apparatus. 4,532,744, Cl. 52-222.000.

Benford, James G., to Allegheny Ludlum Steel Corporation. Method and apparatus for reducing core losses of grain-oriented silicon steel. 4,533,409, Cl. 148-111.000.

Bengmark, Stig; Broome, Albert; and Overland, Christian H., to Uno Plast A/S. Surgical device. 4,533,356, Cl. 604-358.000.

Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., to Eaton Corporation. AC solar cell with alternately generated pn junctions. 4,533,783, Cl. 136-249.000.

Benkeser, Robert A.; Laugal, James A.; and Rappa, Angela, to Purdue Research Foundation. Process for reducing aromatic compounds in ethylenediamine with calcium. 4,533,752, Cl. 564-428.000.

Benkeser, Robert A.; Laugal, James A.; and Rappa, Angela, to Purdue Research Foundation. Process for reducing organic compounds with calcium, amine, and alcohol. 4,533,760, Cl. 568-667.000.

Benovic, Jeffrey L.; Buckler, Robert T.; Burd, John F.; and Li, Thomas M., to Miles Laboratories, Inc. Theophylline immunogens, antibodies, labeled conjugates, and related derivatives. 4,533,493, Cl. 260-112.00B.

Bentley, Trisha: *See*—
Walls, John E.; Dhillon, Major; and Bentley, Trisha, 4,533,619, Cl. 430-157.000.

Berchem, Rutger, to Berchem & Schaberg GmbH. Method of making a piston bottom. 4,532,686, Cl. 29-156.50R.

Berchem & Schaberg GmbH: *See*—
Berchem, Rutger, 4,532,686, Cl. 29-156.50R.

Beringer, Richard D.: *See*—
Evans, Maurice L.; Mola, Clark M.; and Beringer, Richard D., 4,532,665, Cl. 15-21.00D.

Bernard, Georges C., to G.A.M.E.S. Device which can brake and/or stop a load secured to it and which falls, notably an anti-fall safety device. 4,533,026, Cl. 188-184.000.

Bernard, Jean; Beyl, Jean J. A.; Campillo, Christian; and Le Faou, Daniel, to Ste LOOK. Cross-country skiing assembly. 4,533,154, Cl. 280-615.000.

Bertsch, Ludo A.: *See*—
Dodds, David E.; and Bertsch, Ludo A., 4,534,038, Cl. 375-36.000.
Dodds, David E.; and Bertsch, Ludo A., 4,534,039, Cl. 375-36.000.

Besselman, Thomas P., to NCR Corporation. Thermal magnetic transfer ribbon. 4,533,596, Cl. 428-341.000.

Beta Engineering & Development Ltd.: *See*—
Amir, Yoel, 4,533,906, Cl. 340-541.000.

Betton, Arnold L., to Phantom Systems, Inc. Antitheft ignition system and solenoid apparatus for use therewith. 4,533,016, Cl. 180-287.000.

Betts, William L.; and Martinez, Kenneth, to Paradyne Corporation. Phase tracking loop impairment monitor for modems. 4,534,036, Cl. 375-10.000.

Betts, William L.: *See*—
Martinez, Kenneth; and Betts, William L., 4,534,026, Cl. 370-100.000.

Betz Laboratories, Inc.: *See*—
O'Leary, Richard P., 4,533,123, Cl. 261-61.000.

Betzner, William E.; and Holtman, Richard K., to Celotex Corporation, The. Apparatus for blow line addition of thermosettable binder in fiberboard manufacture including a cooling nozzle. 4,533,436, Cl. 162-261.000.

Beveridge, Harold N. Electrode for electrostatic transducer. 4,533,794, Cl. 179-111.00R.

Beyl, Jean J. A.: *See*—
Bernard, Jean; Beyl, Jean J. A.; Campillo, Christian; and Le Faou, Daniel, 4,533,154, Cl. 280-615.000.

Bezold, Helmut, to Kraftwerk Union Aktiengesellschaft. Method for deep-drawing sheet metal and an apparatus for carrying out the method. 4,532,793, Cl. 72-342.000.

Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Surgical sutures made from absorbable polymers of substituted benzoic acid. 4,532,928, Cl. 128-335.500.

BICC Public Limited Company: *See*—
Puckowski, Robert T.; Cooper, Dennis; and Duffy, Patrick J., 4,533,417, Cl. 156-51.000.

Bichara, Michel; Wendling, Emile; and Bodu, Michel, to Mines de Potasse d'Alsace S.A. Process for the manufacture of potassium sulphate by treating solutions containing magnesium chloride and potassium chloride. 4,533,536, Cl. 423-551.000.

Bickelhaupt, Roy E.: *See*—
Altman, Ralph F.; Gooch, John P.; Dismukes, Edward B.; Bickelhaupt, Roy E.; and Dahlin, Robert S., 4,533,364, Cl. 55-5.000.

Bier, David A., to PPG Industries, Inc. Method of spacing sheets and moving groups of spaced sheets. 4,533,073, Cl. 225-4.000.

Biftu, Tesfaye; Witzel, Bruce E.; and Barker, Peter L., to Merck & Co., Inc. 5-(2,3-Dihydro-1H-pyrrolizin-5-oyl)-2-alkanoic or carboxylic acids and analogs as anti-inflammatory and analgesic agents. 4,533,671, Cl. 514-413.000.

Bill, Jacob C., to North American Philips Corporation. Radiation hardenable coating and electronic components coated therewith. 4,533,975, Cl. 361-323.000.

Billon, Alain; Peries, Jean-Pierre; and Quignard, Alain, to Institut Francais du Petrole. Process for the treatment of highly viscous heavy oils at the oil field to effect desalting and transportability thereof. 4,533,462, Cl. 208-88.000.

Bingham, Wallace K., to Minnesota Mining and Manufacturing Company. Thermally stable flame retardant reflective and retroreflective trim. 4,533,592, Cl. 428-213.000.

Binks, Ronald; Rehak, Anthony S.; and Sinberg, Howard, to Siemens Corporate Research & Support, Inc. Circuit for switching between ring signal and message waiting signal without bell tap. 4,533,792, Cl. 179-84.00C.

Binnewies, Hartmut: *See*—
Muller, Alf; Schobbe, Hermann; Loper, Bernd; and Binnewies, Hartmut, 4,533,184, Cl. 301-63.00R.

Biotechnology Development Corporation: *See*—
Cook, Edward J.; and Lagace, Arthur P., 4,533,254, Cl. 366-176.000.

Birchak, James R., to NL Industries, Inc. Parametric acoustic flow meter. 4,532,812, Cl. 73-861.270.

Birkmair, Hubert: *See*—
Heller, Albert; Birkmair, Hubert; and Grauberger, Hermann, 4,532,864, Cl. 101-219.000.
Bischofberger, Jurg, to Rieter Machine Works Ltd. Method and apparatus for time-optimizing occurrence of work at individual operating positions of textile machines. 4,532,759, Cl. 57-264.000.
Bishop, Julian J.: *See*—
Prince, Thomas F.; and Bishop, Julian J., 4,533,197, Cl. 339-97.00R.
Bishop, Ralph L.; Rich, William N.; and Kowalski, Walter C., to Therm-O-Disc, Incorporated. Adjustable bimetal snap disc thermostat with heaters. 4,533,894, Cl. 337-107.000.
Bjorklund, Gary C.; and Sincerbox, Glenn T., to International Business Machines Corporation. Frequency multiplexed optical spatial filter based upon photochemical hole burning. 4,533,211, Cl. 350-162.120.
Black & Decker, Inc.: *See*—
Snaddon, Robert W. L.; and Dietz, Peter W., 4,533,368, Cl. 55-104.000.
Blackwood, Harry P., to Burndy Corporation. IDC termination having means to adapt to various conductor sizes. 4,533,191, Cl. 339-31.00R.
Blackwood, Harry P., to Burndy Corporation. IDC termination for coaxial cable having alignment & stabilizing means. 4,533,193, Cl. 339-65.000.
Blair, John J.; Fonvielle, Frank P.; Smith, Richard A.; Dehoff, Barry D.; and Shue, Roger C., to Dentsply Research & Development Corp. Method and apparatus to produce artificial teeth for dentures. 4,533,325, Cl. 433-171.000.
Blake, Joseph W., III, to Blake, Joseph W., III; and Kaufman, Jack W. Ligator device. 4,532,925, Cl. 128-325.000.
Bland, Gerald F., to Outboard Marine Corporation. Vent and drain assembly for marine propulsion device. 4,533,331, Cl. 440-88.000.
Bland, Linden, to Murphy Oil Company Limited. Evaporation dehydrator. 4,533,366, Cl. 55-42.000.
Blaney, Francis E.; Hadley, Michael S.; King, Francis D.; and Watts, Eric A., to Beecham Group p.l.c. Compounds. 4,533,498, Cl. 260-243.300.
Blank, Izhak, to Forest Laboratories, Inc. Nitroglycerin-containing polymeric matrix for sustained release on topical application. 4,533,540, Cl. 424-28.000.
Blaschek, Otto, to Arnold & Richter Cine Technik GmbH & Co. Betriebs KG. Apparatus for tensioning band or web portions running off and onto two rollers. 4,533,090, Cl. 242-75.000.
Blewitt, Donald D.; and Gupta, Tapan K., to Westinghouse Electric Corp. Monolithic fuse for rotating equipment. 4,533,893, Cl. 337-5.000.
Bliss, John H. Inertial flight director system. 4,534,000, Cl. 364-428.000.
Block, Werner; and Greiler, Wolfgang, to Patent-Treuhand Gesellschaft. High-pressure electric discharge lamp with interfitting socket and support. 4,533,851, Cl. 313-51.000.
Board of Governors for Higher Education, State of Rhode Island, The: *See*—
Krul, William R., 4,532,733, Cl. 47-58.000.
Board of Regents acting for and on behalf of the University of Michigan, The: *See*—
Tien, Tseng-Ying, 4,533,647, Cl. 501-105.000.
Bobik, Carl F.: *See*—
Huseby, Irvin C.; and Bobik, Carl F., 4,533,645, Cl. 501-96.000.
Boden, Richard M.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,533,491, Cl. 252-522.00R.
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Bodet, Jean A.: *See*—
Chazal, Guy A.; and Bodet, Jean A., 4,533,065, Cl. 220-462.000.
Bodu, Michel: *See*—
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Boeing Company, The: *See*—
Baker, Michael E.; and Baker, Thomas M., 4,533,096, Cl. 244-75.00R.
Baukol, David E.; and Dorsey-Palmateer, John W., 4,533,870, Cl. 324-158.00D.
Frank, Ed, 4,532,949, Cl. 137-1.000.
Lambregts, Antonius A., 4,533,999, Cl. 364-429.000.
Boes, Gerhard: *See*—
Forberg, Horst; Achtnig, Klaus-Peter; Hegner, Gunter; and Boes, Gerhard, 4,533,196, Cl. 339-97.00P.
Boetzkes, Peter C., to DSL Dynamic Sciences Limited. Range-enable information system for plural mobile objects. 4,533,871, Cl. 324-207.000.
Bohner, Beat: *See*—
Durr, Dieter; Rohr, Otto; and Bohner, Beat, 4,533,380, Cl. 71-88.000.
Boichut, Philippe; and Jeunet, Guy, to Allied Corporation. Push-pull type connecting device. 4,533,194, Cl. 339-91.00R.
Boitiaux, Jean-Paul; and Oosyns, Jean, to Ste Francaise des Produits pour Catalyse chez Institut Francais du Petrole. Supported palladium-gold catalyst, its manufacture and use in reactions for the selective hydrogenation of diolefinic and/or acetylenic hydrocarbons. 4,533,779, Cl. 585-259.000.
Boivin, Wallace E., Jr.: *See*—
Kramich, Neil J., II; and Boivin, Wallace E., Jr., 4,533,797, Cl. 200-11.0TC.
Bojarski, Suzette M.: *See*—
Coughlan, Raymond T.; and Bojarski, Suzette M., 4,533,600, Cl. 428-414.000.
Bokum, Robert: *See*—
Alexander, Roy; and Bokum, Robert, 4,533,277, Cl. 403-408.100.
Bolens Corporation: *See*—
Merkel, Eugene C., 4,532,756, Cl. 56-202.000.
Bolger, Bernard J.: *See*—
Conway, Paul; Melody, David P.; Woods, John; Casey, J. Eisirt; Bolger, Bernard J.; and Martin, Francis R., 4,533,446, Cl. 204-159.240.
Bollinger, Joseph M., to Rohm and Haas Company. Hydrogenated diolefin-lower alkyl acrylate or methacrylate viscosity index improving copolymers for lubricating oils. 4,533,482, Cl. 252-56.00R.
Bolon, Donald A.; Gorczyca, Thomas B.; and Hallgren, John E., to General Electric Company. Process for the preparation of diaryl carbonates. 4,533,504, Cl. 260-463.000.
Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,532,999, Cl. 172-68.000.
Bonifay, Regis: *See*—
Rojey, Alexandre; Bonifay, Regis; and Cariou, Jean-Paul, 4,532,773, Cl. 62-101.000.
Bonini, Bruno; Cook, Raymond G.; Holdren, Carl F.; and Johnston, Everett A., to General Electric Company. Thrust reverser attachment. 4,533,098, Cl. 244-110.00B.
Bonse, Dirk: *See*—
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Boord, Warren T.; and Fryer, Richard B., to Honeywell Inc. Magnetic field sensor element capable of measuring magnetic field components in two directions. 4,533,872, Cl. 324-252.000.
Booty, Donald J. Electrical power track system. 4,533,190, Cl. 339-21.00R.
Borg-Warner Corporation: *See*—
Lamarche, Paul E., 4,533,032, Cl. 192-107.00M.
Borgmeyer, Virgil L.; Galloway, Dudley L.; Sonnenberg, Gary N.; Gruczka, Jan S.; and Owen, Timothy C., to Westinghouse Electric Corp. Padmounted transformer enclosure. 4,533,786, Cl. 174-50.000.
Borneman, Paul R.; and Hill, James B., to Allegheny Ludlum Steel Corporation. Work-hardenable substantially austenitic stainless steel and method. 4,533,391, Cl. 75-128.00A.
Borsuk, Alvin: *See*—
Mally, Timothy G.; Rattmann, James A.; and Borsuk, Alvin, 4,532,751, Cl. 53-396.000.
Borucki, Gregory J.: *See*—
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Bosch-Siemens Hausgeraete GmbH: *See*—
Bruchmuller, Hans-George, 4,532,806, Cl. 73-579.000.
Deininger, Anton; Nelzow, Hartmann; and Farber, Karlheinz, 4,533,070, Cl. 222-439.000.
Bose, Sudesh: *See*—
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Bossart, Clayton J.; and Fatur, Thomas C., to Mine Safety Appliances Company. Circuit for constant temperature operation of a catalytic combustible gas detector. 4,533,520, Cl. 422-96.000.
Bottenbruch, Ludwig: *See*—
Freitag, Dieter; Bottenbruch, Ludwig; and Schmidt, Manfred, 4,533,702, Cl. 525-439.000.
Bouchard, Roland D. Portable painting assembly. 4,532,886, Cl. 118-326.000.
Boucher, Donald R.: *See*—
Foldvari, Tibor L.; Boucher, Donald R.; and Flanagan, Eugene L., III, 4,533,926, Cl. 346-136.000.
Bourauel, Fritz: *See*—
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,533,900, Cl. 340-52.00R.
Bourdillot, Michel; Gauthier, Andre ; Maille , Jacques; and Pitault, Bernard, to Societe Anonyme de Telecommunications. Process for manufacturing a matrix infrared detector with illumination by the front face. 4,532,699, Cl. 29-572.000.
Bourque, Donald L., to Dennison Manufacturing Company. Dispensing of attachments. 4,533,076, Cl. 227-67.000.
Bowditch, Philip N., to Charles Stark Draper Laboratory, Inc., The. Method of generating a pattern of a flat seam garment. 4,532,655, Cl. 2-243.00B.
Bowen, David R.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,533,746, Cl. 560-144.000.
Bower, David S.: *See*—
Foley, Steven L.; and Bower, David S., 4,533,141, Cl. 273-86.00C.
Bower, Robert W., to Advanced Micro Devices, Inc. Process for forming slots having near vertical sidewalls at their upper extremities. 4,533,430, Cl. 156-643.000.
Bowles, Howard R.: *See*—
Harmon, Larry R.; Reiche, John C.; Bowles, Howard R.; and Chiu, Norman H., 4,533,810, Cl. 219-10.55B.
Boyd, Dana M.; Colombo, Edward A.; and Lashway, William H., to Mobil Oil Corporation. Sandwich foam coextrusion for high performance polyolefin trash bags. 4,533,578, Cl. 428-35.000.
Brader, Walter H., Jr.: *See*—
Lin, Jiang-Jen; and Brader, Walter H., Jr., 4,533,756, Cl. 568-454.000.
Bradshaw, Norman F.; and Schrubba, Gerald P., to Haden Schweitzer Corporation. Water curtain apparatus for heat energy recovery from escaping steam. 4,532,983, Cl. 165-47.000.
Brandeau, Edward P., to Thomas & Betts Corporation. Wire termination tool. 4,532,691, Cl. 29-566.400.

Brattesani, Donald N.: *See—*
Kyriacou, Demetrios; and Brattesani, Donald N., 4,533,454, Cl. 204-272.000.

Brauer, Melvin: *See—*
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Braun, Klaus, to Bodenseewerk Perkin-Elmer & Co., GmbH. Photometer for measuring atomic fluorescence. 4,533,246, Cl. 356-317.000.

Braun, Walter J.: *See—*
Baugh, Robert F.; Braun, Walter J.; and Cooper, Daniel, 4,533,519, Cl. 422-73.000.

Brayman, Semyon; and Bullock, Ronald N. Method of temperature compensating leak rate testing. 4,532,795, Cl. 73-40.000.

Breitenfeld, Horst: *See—*
Rehm, Hans; and Breitenfeld, Horst, 4,533,878, Cl. 330-261.000.

Brennan, Edward J., to PTC Aerospace Inc. Convertible seat. 4,533,175, Cl. 297-232.000.

Bresson, Clarence R.; Robles, Benjamin R.; and Parlman, Robert M., to Phillips Petroleum Company. Polycarboxylic acid derivatives and uses. 4,533,466, Cl. 209-167.000.

Bresson, Clarence R.: *See—*
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,533,467, Cl. 209-167.000.

Bridgestone Tire Company Limited: *See—*
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,533,711, Cl. 526-340.400.
Tomita, Naotaka; and Watanabe, Toshiyuki, 4,532,807, Cl. 73-602.000.

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Bristol-Myers Company: *See—*
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,533,631, Cl. 435-70.000.

British Aerospace Public Limited Company: *See—*
Yates, Ivan R., 4,533,095, Cl. 244-23.00D.

British Nuclear Fuels Limited: *See—*
Mathews, Clive A.; and Gillies, George M., 4,533,319, Cl. 432-3.000.

British Petroleum Company p.l.c., The: *See—*
Ball, William J.; Barri, Sami A. I.; and Young, Dennis, 4,533,649, Cl. 502-71.000.
Griggs, Colin G., 4,533,774, Cl. 568-866.000.

Broken Hill Proprietary Company Limited, The: *See—*
Ensor, Paul M. D.; and Bassett, Neville C., 4,533,468, Cl. 209-172.000.

Brook, Mark V.: *See—*
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Broome, Albert: *See—*
Bengmark, Stig; Broome, Albert; and Overland, Christian H., 4,533,356, Cl. 604-358.000.

Brossi, Arnold; and Kerekes, Peter, to United States of America, Health and Human Services. Carbamates of colchicine for treatment of gout. 4,533,675, Cl. 514-480.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Kurachi, Hisao; Ito, Takeo; Iwase, Takayuki; and Shiota, Junji, 4,533,267, Cl. 400-214.000.

Brown, Leland T., to Motorola, Inc. Series current limiter. 4,533,970, Cl. 361-58.000.

Brown & Williamson Tobacco Corporation: *See—*
Reed, Steven P.; and Naslund, Erik I., 4,533,427, Cl. 156-500.000.

Bruce, Thomas W.: *See—*
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,532,762, Cl. 60-39.230.

Bruchmuller, Hans-George, to Bosch-Siemens Hausgeraete GmbH. Sensor for monitoring the deposition of frozen fog and/or ice on surfaces. 4,532,806, Cl. 73-579.000.

Brudermanns, Karola: *See—*
Waniczek, Helmut; Uerdingen, Walter; and Brudermanns, Karola, 4,533,728, Cl. 528-370.000.

Bruinsma, Hans; Hollander, Frans; Huisman, Rein L.; and Reinen, Adrianus G., to Estel Hoogovens B.V. Process for reducing the width of a flat metal product by rolling. 4,532,789, Cl. 72-202.000.

Brunner, Rudolf, to Heilmeier & Weinlein Fabrik Fuer Oel-Hadraulik GmbH & Co., KG. Control valve device. 4,532,960, Cl. 137-596.130.

Brunswick Corporation: *See—*
Staerzl, Richard E., 4,532,903, Cl. 123-436.000.

Bryant, Jeffrey A.: *See—*
Cushenbery, Terry E.; and Bryant, Jeffrey A., 4,532,837, Cl. 82-4.00C.

Buchanan, Robert D., to Porritts & Spencer. Batt-on-mesh felt employing polyurethane-coated multifilaments in the cross-machine direction. 4,533,594, Cl. 428-236.000.

Buchanan, Robert M.: *See—*
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,533,443, Cl. 204-84.000.

Buchner, Norbert; Eberspacher, Rolf; and Liede, Dieter, to Robert Bosch GmbH. Container lid having an opening device. 4,533,063, Cl. 220-270.000.

Buck, Alfred, to Memminger GmbH. Knitting machine. 4,532,781, Cl. 66-104.000.

Bucklee-Mears Company: *See—*
Walter, Leo, 4,533,978, Cl. 361-419.000.

Buckler, Robert T.: *See—*
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Budapesti Muszaki Egyetem: *See—*
Gal, Jozsef; Gyarfas, Andras; Katko , Laszlo ; Racz, Gabor; Sarlos, Agoston; and Vozari, Gyula, 4,533,912, Cl. 340-783.000.

Buddenbaum, Harry C.; and Robison, Robert L., to Eli Lilly and Company. Pharmaceutical compositions for storage in plastic containers and process therefor. 4,533,542, Cl. 424-31.000.

Buehl, Arnold L., to Slyman Manufacturing Corporation. Radiant burner. 4,533,318, Cl. 431-328.000.

Buglione, Arthur J.; and Coats, James M., to Ford Motor Company. Selective single fire/double fire fuel injection control. 4,532,907, Cl. 123-490.000.

Buhler, Ernst, to AG fur industrielle Elektronik AGIE Losone b. Locarno. Method for automatic process control in spark erosive machining. 4,533,811, Cl. 219-69.00M.

Bullock, Ronald N.: *See—*
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Bulow, Jeffrey A.: *See—*
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Bults, Gerard: *See—*
Cahen, David; Malkin, Shmuel; Horwitz, Benjamin; and Bults, Gerard, 4,533,252, Cl. 356-432.000.

Bump, Boyd E.: *See—*
Gee, Gary W.; Shumate, Daniel L.; Nieder, John J.; Bump, Boyd E.; and Kource, Robert D., 4,532,815, Cl. 73-864.630.

Burba, Christian; Goeke, Ulrich; and Esper, Norbert, to Schering AG. Polyvinyl chloride plastisols. 4,533,524, Cl. 427-372.200.

Burd, John F.: *See—*
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Burda, Ferencne : *See—*
Muranyi, Istvan; Balazs, Laszlone ; Molnar, Jozsef; Burda, Ferencne ; Metzler, Maria; and Szerdahelyi, Lajos, 4,533,638, Cl. 435-288.000.

Burke, Donald D.; and Cloninger, Jerry L. Automatic high pressure hose uncoupling device. 4,533,161, Cl. 285-1.000.

Burks, William M., Jr.; Doane, Elliott P.; Campbell, Ramsey G.; and Velez, Emilio S., to Stauffer Chemical Company. Process for treating liquid chlorinated hydrocarbon wastes containing iron. 4,533,473, Cl. 210-754.000.

Burlington Industries, Inc.: *See—*
Gamblin, Rodger L., 4,533,441, Cl. 204-3.000.

Burndy Corporation: *See—*
Blackwood, Harry P., 4,533,191, Cl. 339-31.00R.
Blackwood, Harry P., 4,533,193, Cl. 339-65.000.
Feldberg, Leonard, 4,533,199, Cl. 339-99.00R.
Frank, Walter, 4,533,205, Cl. 339-247.000.

Burnett, Mark B.: *See—*
Medeiros, David J.; and Burnett, Mark B., 4,533,743, Cl. 549-489.000.

Burns, Daniel E., to Demco, Inc. Portable field site pre-cooling apparatus. 4,532,774, Cl. 62-239.000.

Burns, James E. Portable decollating machine, 4,533,131, Cl. 270-52.500.

Burns, Richard D.: *See—*
Moodie, Eldon E.; and Burns, Richard D., 4,533,587, Cl. 428-166.000.

Burns & Russell Company, The: *See—*
McClinton, John L.; and Russell, Alexander H., 4,533,568, Cl. 427-135.000.

Burnside, Royal D., III. Portable cooking apparatus. 4,532,912, Cl. 126-30.000.

Burroughs Corporation: *See—*
Sheth, Jayesh V., 4,534,013, Cl. 364-900.000.
Tezucar, Okan K.; and Parisi, David A., 4,533,913, Cl. 340-805.000.

Burrows, Esther J. Walker with a flexible seat. 4,532,948, Cl. 135-67.000.

Busby, David E.: *See—*
Chang, Feng-Chih; Wernli, Susan A.; and Busby, David E., 4,533,764, Cl. 568-724.000.

Butler, John C.: *See—*
Keane, John F.; Butler, John C.; and Archer, Timothy H., 4,533,941, Cl. 358-75.000.

Butz, Peter; Ranke, Gerhard; and Tvan, Tran A., to Linde Aktiengesellschaft. Separation of CO_2 and H_2S from hydrogen containing gas. 4,533,373, Cl. 62-17.000.

Byford, Roger G.: *See—*
Feilchenfeld, Michal M.; Byford, Roger G.; and Quan, Wing C., 4,534,056, Cl. 381-42.000.

Bynum, Byron G.; and Cave, David L., to Motorola, Inc. Current limit technique for multiple-emitter vertical power transistor. 4,533,845, Cl. 307-540.000.

C.G.R. - Mev: *See—*
Milcamps, Jacques, 4,534,052, Cl. 378-152.000.

C.M.L. Costruzioni Meccaniche Liri S.r.l.: *See—*
Caporusso, Alessandro; and Caporusso, Mario, 4,532,787, Cl. 72-158.000.

C. van der Lely N.V.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,532,999, Cl. 172-68.000.

Cable Technology Laboratories, Inc.: *See—*
Katz, Carlos, 4,533,789, Cl. 174-102.00R.

Cabot Corporation: *See—*
Asphahani, Aziz I., 4,533,414, Cl. 148-427.000.
Cadtrak Corporation: *See—*
Sukonick, Josef; and Fjallstam, Bjorn M., 4,533,910, Cl. 340-721.000.
Cahen, David; Malkin, Shmuel; Horwitz, Benjamin; and Bults, Gerard, to Yeda Research and Development Company Ltd. Device and method and measurement of photosynthetic activity by photoacoustic spectroscopy. 4,533,252, Cl. 356-432.000.
Calabrese, Gary S.: *See—*
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,533,443, Cl. 204-84.000.
Calgon Corporation: *See—*
Costello, Christine A., 4,533,708, Cl. 526-295.000.
Callaghan, Timothy J.; and Kay, Robert M., to Honeywell Inc. Readout apparatus for a ring laser angular rate sensor. 4,533,250, Cl. 356-350.000.
Calvert, Rodney K., to Mead Corporation, The. Heel retaining structure on bottle carrier. 4,533,047, Cl. 206-434.000.
Campau, Daniel N. Metering apparatus for dispensing precise volumes of liquid. 4,532,962, Cl. 137-842.000.
Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., to Occidental Chemical Corporation. Preparation of chlorotrifluoroethylene telomers with bisfluoroxydifluoromethane. 4,533,762, Cl. 568-677.000.
Campbell, John E.: *See—*
Bailey, Thomas F.; Campbell, John E.; Rives, Allen K.; and Shah, Nehal M., 4,533,003, Cl. 175-269.000.
Campbell, John R.; and Thackeray, James W., to General Electric Company. Interfacial polycondensation polycarbonate process with quaternary phosphonium amino halide catalyst. 4,533,722, Cl. 528-199.000.
Campbell, Karen J.: *See—*
Evans, Jack L.; Campbell, Karen J.; Kreil, Curtis L.; and Sidney, LuAnn, 4,533,566, Cl. 427-44.000.
Campbell, Ramsey G.: *See—*
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Campillo, Christian: *See—*
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Canon Kabushiki Kaisha: *See—*
Fujimura, Naoto; Sonobe, Akihiro; Yoshihara, Toshiyuki; Takebayashi, Norie; Tanaka, Takashi; and Kuribayashi, Masaki, 4,533,232, Cl. 355-3.00R.
Fukumoto, Hiroshi; Inoue, Sukejiro; Sasakawa, Masumi; and Doi, Shinji, 4,533,614, Cl. 430-99.000.
Inoue, Sukejiro; Fukumoto, Hiroshi; Sasakawa, Masumi; and Doi, Shinji, 4,533,617, Cl. 430-111.000.
Ishikawa, Yasuyuki, 4,533,222, Cl. 351-206.000.
Masunaga, Makoto; and Taka, Hideo, 4,533,241, Cl. 356-1.000.
Ohsaki, Ichiro; Hasegawa, Tetsuo; and Suematsu, Koushi, 4,533,616, Cl. 430-110.000.
Shigenobu, Michio, 4,533,231, Cl. 355-3.0FU.
Shimizu, Seiichi, 4,533,212, Cl. 350-318.000.
Sugiura, Susumu; and Kohzato, Yasuo, 4,533,928, Cl. 346-140.00R.
Suwa, Kaname, 4,533,976, Cl. 361-395.000.
Suzuki, Eiichi, 4,533,920, Cl. 346-1.100.
Suzuki, Eiichi, 4,533,923, Cl. 346-1.100.
Caporusso, Alessandro; and Caporusso, Mario, to C.M.L. Costruzioni Meccaniche Liri S.r.l. Portable electromechanically-controlled pipe-bending apparatus. 4,532,787, Cl. 72-158.000.
Caporusso, Mario: *See—*
Caporusso, Alessandro; and Caporusso, Mario, 4,532,787, Cl. 72-158.000.
Cardenas, Carlos G.: *See—*
Cherney, Leon; Gorman, Charles R.; Traynor, Sean G.; and Cardenas, Carlos G., 4,533,751, Cl. 564-408.000.
Cardenas-Franco, Luis; and Veazey-Menendez, Enrique, to Vitro-Tec Fideicomiso. Solenoid actuated valve blocks for glassware forming machines. 4,532,956, Cl. 137-340.000.
Cardiac Pacemakers, Inc.: *See—*
Mills, Perry A., 4,532,931, Cl. 128-419.0PG.
Cargnel, Louis A., to Westinghouse Electric Corp. Oil and high temperature resistant insulating varnish made from modified methoxy functional diphenyl oxide. 4,533,718, Cl. 528-86.000.
Cargnino, Francesco; Natoli, Giuseppe; and Lorke, Horst, to Hoechst Aktiengesellschaft. Corrosion inhibitors for aqueous liquids for the working of metals, and a process for their preparation. 4,533,479, Cl. 252-34.000.
Cariou, Jean-Paul: *See—*
Rojey, Alexandre; Bonifay, Regis; and Cariou, Jean-Paul, 4,532,773, Cl. 62-101.000.
Carl Hurth Maschinen-und Zahnradfabrik GmbH & Co.: *See—*
Gregg, Hans, 4,533,034, Cl. 198-472.000.
Carl, Wolfgang: *See—*
Guckilhorn, Karl; and Carl, Wolfgang, 4,532,693, Cl. 29-568.000.
Carlisle, Floyd L., to Theratronics, Inc. Electrotherapy apparatus. 4,532,938, Cl. 128-801.000.
Carlos, Donald D., to Ashland Oil, Inc. Redox catalyst plus promoter for oxidation of hydrocarbons. 4,533,458, Cl. 208-3.000.
Carpenter, Ralph F.; and Gordon, David R., to Pacific Electro Dynamics, Inc. Multiple voltage switching power supply having output voltage limiting. 4,533,836, Cl. 307-11.000.
Carre, Jean-Jacques; Courbot, Pierre; and Mery, Jean-Claude, to Societe Anonyme D.B.A. Elastic and sliding locking device for disc brake with a floating caliper supported by a single axial pin, and disc brake equipped with such a device. 4,533,023, Cl. 188-73.340.
Carre , Jean-Jacques, to Societe Anonyme D.B.A. Disc brake with a sliding caliper. 4,533,025, Cl. 188-73.440.
Carrier Corporation: *See—*
Clark, William E.; and Carucci, James, 4,533,080, Cl. 236-49.000.
Carucci, James: *See—*
Clark, William E.; and Carucci, James, 4,533,080, Cl. 236-49.000.
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CasChem, Inc.: *See—*
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Cascio, Giuseppe: *See—*
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Caseley, Jane R., to Windleshaw Enterprises Limited. Filter for reducing the toxic effects of cigarette tobacco smoke. 4,532,947, Cl. 131-331.000.
Casey, J. Eisirt: *See—*
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Casio Computer Co., Ltd.: *See—*
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Cassatta, Joseph C.; and Chattha, Mohinder S., to Ford Motor Company. Crosslinked flow control additives for high solids paints I. 4,533,681, Cl. 523-400.000.
Cassella Aktiengesellschaft: *See—*
Dorries, Peter; and Wahl, Helmut, 4,533,590, Cl. 428-211.000.
Caudel, Edward R.: *See—*
Magar, Surendar S.; and Caudel, Edward R., 4,533,992, Cl. 364-200.000.
Cave, David L.: *See—*
Bynum, Byron G.; and Cave, David L., 4,533,845, Cl. 307-540.000.
Cavell, Kingsley J.: *See—*
Masters, Anthony F.; and Cavell, Kingsley J., 4,533,651, Cl. 502-117.000.
CDP, Ltd.: *See—*
Ecer, Gunes M., 4,533,004, Cl. 175-329.000.
Cecchi, Marino; Borucki, Gregory J.; and Happ, Lawrence R., to Suncom, Incorporated. Video cassette rapid rewinding/fast forwarding device. 4,533,092, Cl. 242-186.000.
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Polycyclic ether antibiotic. 4,533,553, Cl. 514-460.000.
Celotex Corporation, The: *See—*
Betzner, William E.; and Holtman, Richard K., 4,533,436, Cl. 162-261.000.
Cense, Adriaan; and Schutte, Evert H., to U.S. Philips Corporation. Integrable hue control circuit having a d.c. setting element. 4,533,939, Cl. 358-28.000.
Centronics Data Computer Corp.: *See—*
Moss, James R., 4,532,862, Cl. 101-93.320.
Cerwin, Robert J.: *See—*
Aday, Jorge L.; and Cerwin, Robert J., 4,533,041, Cl. 206-63.300.
Chadwick, Donald T.: *See—*
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Chaki, Takao, to Clarion Co., Ltd. Tuning shaft of pushbutton tuner. 4,532,817, Cl. 74-10.330.
Chalupka, George: *See—*
Muschelknautz, Edgar; Rink, Norbert; and Chalupka, George, 4,533,376, Cl. 65-5.000.
Chambers, Edward A.: *See—*
Geis, Norman P.; and Chambers, Edward A., 4,533,094, Cl. 244-3.220.
Champion, Preston L. Animal deterrent device for joggers. 4,533,140, Cl. 273-84.00R.
Chandley, George D., to Hitchiner Manufacturing Co., Inc. Gas permeable metal casting mold having gas collection voids. 4,532,976, Cl. 164-363.000.
Chang, Feng-Chih; Wernli, Susan A.; and Busby, David E., to Dow Chemical Company, The. Purification of bisphenols by removing residual solvent. 4,533,764, Cl. 568-724.000.
Chang, Hong-Tswen: *See—*
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Chang, Jen W.; and Chang, Hong-Tswen. Device for supporting a circular saw of sawing machine. 4,532,844, Cl. 83-477.100.
Chang, Ten-Ho; and Wang, Shin-Yih. Electrical energy saving device for motors. 4,533,857, Cl. 318-345.00A.
Chappell, Barbara A.; Chappell, Terry I.; and Woodall, Jerry M. High spatial resolution energy discriminator. 4,533,940, Cl. 358-44.000.
Chappell, Terry I.: *See—*
Chappell, Barbara A.; Chappell, Terry I.; and Woodall, Jerry M., 4,533,940, Cl. 358-44.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
Bowditch, Philip N., 4,532,655, Cl. 2-243.00B.
Das, Dilip K.; Kumar, Kaplesh; and Wettstein, Ernest C., 4,533,407, Cl. 148-102.000.
Charvat, Rudolf M.: *See—*
Prinz, A. F. Rudolf; and Charvat, Rudolf M., 4,532,810, Cl. 73-717.000.
Chattha, Mohinder S.: *See—*
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Theodore, Ares N.; and Chattha, Mohinder S., 4,533,695, Cl. 524-504.000.

Chauvin, Yves; Commereuc, Dominique; Hirschauer, Andre ; Reffet, Dominique; and Stern, Robert, to Institut Francais du Petrole; and Societe Nationale Elf-Aquitaine (Production). Process for manufacturing N-acyliminodiacetic acids. 4,533,500, Cl. 260-404.000.

Chazal, Guy A.; and Bodet, Jean A., to Societe Parisienne D'Impression et de Cartonnage. Container having one piece peripheral rim, at least two cardboard parts and a synthetic material layer. 4,533,065, Cl. 220-462.000.

Cherney, Leon; Gorman, Charles R.; Traynor, Sean G.; and Cardenas, Carlos G., to SCM Corporation. Preparation of 1,3-dienamines from myrcene and substituted myrcene. 4,533,751, Cl. 564-408.000.

Cheskis, Harvey P.: *See—*
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,533,388, Cl. 75-76.000.

Chevron Research Company: *See—*
King, William F., 4,533,658, Cl. 514-92.000.

Chew, Ju-Nam; and Savins, Joseph G., to Mobil Oil Corporation. Method for comminuting bituminous coal using an aqueous methanol solution. 4,533,084, Cl. 241-1.000.

Chiarito, Richard J., to U.M.E., Incorporated. Method and apparatus for fluid filtration including particle precipitation. 4,533,475, Cl. 210-788.000.

Chicago Bridge & Iron Company: *See—*
Cutler, Donald R., 4,532,985, Cl. 165-118.000.

Chick, Orest N.: *See—*
Khalil, Hamdy; and Chick, Orest N., 4,533,691, Cl. 524-401.000.

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Chisso Corporation: *See—*
Fukui, Masahiro; Kitano, Kisei; Tanaka, Masami; and Goto, Yasuyuki, 4,533,488, Cl. 252-299.610.
Sato, Akihiro; Kikuta, Kazutsune; Uwai, Toshihiro; Matsuda, Kenji; and Hattori, Nobutaka, 4,533,705, Cl. 526-114.000.

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Harmon, Larry R.; Reiche, John C.; Bowles, Howard R.; and Chiu, Norman H., 4,533,810, Cl. 219-10.55B.

Choe, Eui W.; and Conciatori, Anthony B., to Delanese Corporation. Synthesis of high molecular weight polybenzimidazole with arylhalo phosphorus compound catalyst. 4,533,725, Cl. 528-336.000.

Christensen, Wendell N. Dual-mode ratchet wrench. 4,532,832, Cl. 81-57.290.

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Chrysler Corporation: *See—*
Hoenle, Walter A.; Perkins, David J.; and Schenten, James L., 4,533,157, Cl. 280-718.000.
Razzacki, Syed T., 4,532,823, Cl. 74-473.00R.

Chu, Daniel T., to Abbott Laboratories. Quino-benzothiazine antibacterial compounds. 4,533,663, Cl. 514-223.000.

Chu, Kwo R.: *See—*
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Chugunny, Evgeny G.: *See—*
Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., 4,533,243, Cl. 356-44.000.

Chun, Andrew. Pedal powered sailboat. 4,533,330, Cl. 440-30.000.

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Yates, Andrew W.; Harradine, Brian D.; and Wraith, Michael A., 4,533,627, Cl. 430-567.000.

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Clark, Malcolm C.; Henshall, John B.; and Hart, Derrick A., 4,533,499, Cl. 260-391.000.
Durr, Dieter; Rohr, Otto; and Bohner, Beat, 4,533,380, Cl. 71-88.000.
Eckhardt, Wolfgang; and Kunz, Walter, 4,533,659, Cl. 514-184.000.
Spencer, Alwyn, 4,533,505, Cl. 260-465.00R.
Szczepanski, Henry, 4,532,732, Cl. 47-57.600.

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Feldman, Steven; and Cihak, Richard J., 4,533,203, Cl. 339-176.00M.

Ciraud, Pierre H. Machine for spreading and smoothing surface coverings. 4,532,882, Cl. 118-108.000.

Clarion Co., Ltd.: *See—*
Chaki, Takao, 4,532,817, Cl. 74-10.330.
Kume, Masato, 4,533,966, Cl. 360-96.500.
Tanaka, Yoshio; Nishikawa, Yasuhisa; Hasumi, Ryoichi; and Koizumi, Takashi, 4,532,818, Cl. 74-10.330.

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Clark, Edward C.; and Huxtable, Douglas D., to Rocket Research Company. Chemical heat pump and chemical energy storage system. 4,532,778, Cl. 62-477.000.

Clark, K. Warren: *See—*
Morris, William M.; Witzel, Frank; Puglia, Wayne J.; Mackay, Donald A. M.; Clark, K. Warren; and Patanasinth, Kanit J., 4,533,543, Cl. 424-38.000.

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Clark, Marion A., to Good, Don, a part interest. Automatic variable speed lever action drive. 4,533,152, Cl. 280-251.000.

Clark, William E.; and Carucci, James, to Carrier Corporation. Air terminal—air handler interface. 4,533,080, Cl. 236-49.000.

Clevite S.r.l.: *See—*
Losio, Gastone, 4,533,261, Cl. 384-296.000.

Clifton, Oscar N.: *See—*
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.

Cloeren, Peter. Multimanifold extrusion die and coextrusion process. 4,533,308, Cl. 425-131.100.

Cloninger, Jerry L.: *See—*
Burke, Donald D.; and Cloninger, Jerry L., 4,533,161, Cl. 285-1.000.

Coal Industry (Patents) Ltd.: *See—*
French, Albert G.; and Eagles, Brian A., 4,533,180, Cl. 299-1.000.

Coates, Roy M.: *See—*
Toma, Petre; Redford, David A.; Livesey, Declan B.; and Coates, Roy M., 4,532,994, Cl. 166-303.000.

Coats, James M.: *See—*
Buglione, Arthur J.; and Coats, James M., 4,532,907, Cl. 123-490.000.

Coder, David W.; Wisler, Benjamin B., Jr.; Clark, Albert P.; and Ratcliffe, Raymond J., to United States of America, Navy. Method and apparatus for determining small magnitude fluid-dynamic drag resistance differentials between different structural configurations of a model. 4,532,801, Cl. 73-432.00R.

Coenen, Hubert; and Kriegel, Ernst, to FRIED. KRUPP Gesellschaft mit beschrankter Haftung. Method for recovering petroleum. 4,532,992, Cl. 166-267.000.

Coffy, Rene L., to Societe Nationale Industrielle Aerospatiale. Process and apparatus for metallic impregnation of a web of conductive fibres. 4,532,889, Cl. 118-718.000.

Coleman, Clarence B., to Fabricated Metals, Inc. Level indicator for liquid container with a follower. 4,532,800, Cl. 73-308.000.

Coleman Company, Inc., The: *See—*
Addison, Gilbert J., 4,533,317, Cl. 431-100.000.

Coleman, Edwin B.: *See—*
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,532,762, Cl. 60-39.230.

Collier, Warren, to Tektronix, Inc. Device for recording host electronic instrument operating on-time. 4,534,045, Cl. 377-16.000.

Collins, Henry R., Jr. Self-cleaning liquid filter and system. 4,533,471, Cl. 210-138.000.

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Boyd, Dana M.; Colombo, Edward A.; and Lashway, William H., 4,533,578, Cl. 428-35.000.

Comau S.p.A.: *See—*
Vittorio, Corni, 4,533,823, Cl. 235-375.000.

Comber S.p.A. Costruzioni Meccaniche Bergamasche: *See—*
Verri, Vittorio; and Christiani, Renato, 4,533,472, Cl. 210-350.000.

Combustion Engineering, Inc.: *See—*
Anderson, David K., 4,532,872, Cl. 110-255.000.
Deve, Vagn, 4,533,087, Cl. 241-65.000.
Malone, Dennis M., 4,533,856, Cl. 318-6.000.
Wentzell, Timothy H.; and Brook, Mark V., 4,532,808, Cl. 73-640.000.

Commereuc, Dominique: *See—*
Chauvin, Yves; Commereuc, Dominique; Hirschauer, Andre ; Reffet, Dominique; and Stern, Robert, 4,533,500, Cl. 260-404.000.

Commissariat a l'Energie Atomique: *See—*
Dargent, Bruno, 4,533,431, Cl. 156-643.000.

Commonwealth of Australia, Dept. of Science & Technology: *See—*
Crosby, Peter A.; Daly, Christopher N.; Money, David K.; Patrick, James F.; Seligman, Peter M.; and Kuzma, Janusz A., 4,532,930, Cl. 128-419.00R.

Commonwealth Scientific and Industrial Research Organization: *See—*
Masters, Anthony F.; and Cavell, Kingsley J., 4,533,651, Cl. 502-117.000.

Comper, Louis F.; and Scheiderich, Robert F., to Goodyear Tire & Rubber Company, The. Surface treated tire curing bladder, treatment composition therefor and method for curing tires. 4,533,305, Cl. 425-43.000.

Conciatori, Anthony B.: *See—*
Choe, Eui W.; and Conciatori, Anthony B., 4,533,725, Cl. 528-336.000.

Congley, James B., Jr. Portable, knockdown field stove. 4,532,910, Cl. 126-9.00B.

Conly, Ralph A.; and Latimer, Stanley M., to Ampex Corporation. Multiple leg multichannel magnetic transducer structure and method of manufacturing. 4,533,967, Cl. 360-123.000.

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Grabovac, Bosko, 4,532,836, Cl. 81-483.000.

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Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.

Conway, Paul; Melody, David P.; Woods, John; Casey, J. Eisirt; Bolger, Bernard J.; and Martin, Francis R., to Loctite (Ireland) Ltd. Radiation-activatable anaerobic adhesive composition. 4,533,446, Cl. 204-159.240.

Cook, Edward J.; and Lagace, Arthur P., to Biotechnology Development Corporation. Apparatus for forming emulsions. 4,533,254, Cl. 366-176.000.

Cook, Raymond G.: *See*—
Bonini, Bruno; Cook, Raymond G.; Holdren, Carl F.; and Johnston, Everett A., 4,533,098, Cl. 244-110.00B.

Cooper, Christopher A., to Marley Tile A.G. Roof ridge capping system. 4,532,739, Cl. 52-57.000.

Cooper, Daniel: *See*—
Baugh, Robert F.; Braun, Walter J.; and Cooper, Daniel, 4,533,519, Cl. 422-73.000.

Cooper, Dennis: *See*—
Puckowski, Robert T.; Cooper, Dennis; and Duffy, Patrick J., 4,533,417, Cl. 156-51.000.

Cooper Industries, Inc.: *See*—
Squires, V. Alan, 4,532,955, Cl. 137-15.000.

Copal Company Limited: *See*—
Shimizu, Munetaka, 4,533,270, Cl. 400-636.000.

Copeland, David C. Plumbing apparatus. 4,532,718, Cl. 33-390.000.

Copeland, John A.; and Miller, Stewart E., to AT&T Bell Laboratories. Optically coupled integrated circuit array. 4,533,833, Cl. 250-551.000.

Coppens, Anton; and Poldervaart, Leendert, to Single Buoy Moorings, Inc. Mooring system. 4,533,332, Cl. 441-3.000.

Cordier, Georges, to Rhone-Poulenc Specialites Chimiques. Process for the preparation of trifluoroethanol. 4,533,771, Cl. 568-842.000.

Cordis Corporation: *See*—
Batty, John R., Jr., 4,532,932, Cl. 128-631.000.

Core-Form: *See*—
Kinard, George P., 4,532,745, Cl. 52-251.000.

Corey, John A., to Mechanical Technology Incorporated. Stirling engine with air working fluid. 4,532,765, Cl. 60-517.000.

Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, to Ruhrchemie Aktiengesellschaft. Process for the hydroformylation of olefins. 4,533,755, Cl. 568-454.000.

Cornish, William D.; and Hewitt, Lawrence B., to Minister of National Defence. Self-biasing broadband frequency divider. 4,533,886, Cl. 333-218.000.

Cornwell, Ross E., Jr.; Czech, John F.; and Domoleczny, James D., to Zenith Electronics Corporation. Tiltable display monitor assembly. 4,533,105, Cl. 248-371.000.

Corona, Stephen C.: *See*—
Hammond, Thomas J.; Lama, William L.; Northrup, Karl A.; and Corona, Stephen C., 4,533,853, Cl. 315-117.000.

Corrigan, Patrick J.; King, Richard M.; and VanDiest, Scott A., to Procter & Gamble Company, The. Regeneration of copper chromite hydrogenation catalyst. 4,533,648, Cl. 502-38.000.

Corsover, William L.; Hoffman, Kenneth P.; McCann, William F.; and Wooden, Billy J. Expansion joint system. 4,533,278, Cl. 404-65.000.

Cory, John M.; Varney, Edward W.; Babcock, Jon A.; and Pupillo, Andrew, to Posi-Seal International, Inc. Fail-safe actuator for rotary valves. 4,533,114, Cl. 251-67.000.

Cosgrove, Robert J., Jr.; and Smolen, Victor F., to PharmaControl Corporation. System for automatic feedback-controlled administration of drugs. 4,533,346, Cl. 604-66.000.

Costello, Christine A., to Calgon Corporation. Polyampholyte polymer. 4,533,708, Cl. 526-295.000.

Coughlan, Raymond T.; and Bojarski, Suzette M., to Daubert Coated Products Inc. Sealant sheet material. 4,533,600, Cl. 428-414.000.

Coulter Systems Corporation: *See*—
Keane, John F.; Butler, John C.; and Archer, Timothy H., 4,533,941, Cl. 358-75.000.

Courbot, Pierre: *See*—
Carre, Jean-Jacques; Courbot, Pierre; and Mery, Jean-Claude, 4,533,023, Cl. 188-73.340.

Courtois, Yves: *See*—
Guedon born Saglier, Isabelle; Barritault, Denis; Courtois, Yves; Arruti, Cristina; and Prunieras, Michel, 4,533,635, Cl. 435-240.000.

Courty, Philippe; Roussel, Michel; Leporq, Serge; Le Page, Jean-Francois; and Varin, Philippe, to Institut Francais du Petrole. Process for manufacturing a catalyst containing iron, chromium and potassium oxides and at least one rare earth metal oxide, for use in dehydrogenation reactions. 4,533,650, Cl. 502-84.000.

Cousin, Charles M.; and Gondrella, Frederick H., Sr. Construction system for cast-in-place concrete barriers for roadways. 4,533,111, Cl. 249-2.000.

Cox, Robert L.: *See*—
Rivers, John; Kramer, Charles D.; and Cox, Robert L., 4,532,873, Cl. 110-347.000.

Cozza, Giorgio; and Piccolo, Luigi, to Ing. Luigi Conti Vecchi S.p.A. Method of obtaining magnesium sulphate from mixtures of salts. 4,533,360, Cl. 23-298.000.

Craig, David R. Inflatable wader tree. 4,533,072, Cl. 223-67.000.

Critikon: *See*—
Kratochvil, Jiri; and Janata, Jiri, 4,533,456, Cl. 204-415.000.

Crosby, Peter A.; Daly, Christopher N.; Money, David K.; Patrick, James F.; Seligman, Peter M.; and Kuzma, Janusz A., to Commonwealth of Australia, Dept. of Science & Technology. Cochlear implant system for an auditory prosthesis. 4,532,930, Cl. 128-419.00R.

Crouch, William B.: *See*—
Jahnke, Frederick C.; and Crouch, William B., 4,533,363, Cl. 48-197.00R.

Cuderm Corporation: *See*—
Miller, David L., 4,532,937, Cl. 128-759.000.

Cullen, Walter P.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,533,553, Cl. 514-460.000.

Cummins Engine Company, Inc.: *See*—
Day, Eric; and VanDerStuyf, Allen F., 4,532,893, Cl. 123-41.310.

Curatolo, Benedict S.: *See*—
Fox, Joseph R.; Pesa, Frederick A.; and Curatolo, Benedict S., 4,533,775, Cl. 568-905.000.

Curran, John F.; and Kershaw, Thomas N., to Scott Paper Company. Papermaking machine. 4,533,437, Cl. 162-281.000.

Cushenbery, Terry E.; and Bryant, Jeffrey A. Nipple grooving device. 4,532,837, Cl. 82-4.00C.

Custer, Donald J.: *See*—
McLaughlin, James L.; Custer, Donald J.; and Donze, Richard J., 4,532,791, Cl. 72-275.000.

Cutler, Donald R., to Chicago Bridge & Iron Company. Falling film heat exchanger. 4,532,985, Cl. 165-118.000.

Cutler, Scott E.: *See*—
Tiemann, Jerome J.; Cutler, Scott E.; and Welles, Kenneth B., II, 4,533,960, Cl. 358-310.000.

Czech, John F.: *See*—
Cornwell, Ross E., Jr.; Czech, John F.; and Domoleczny, James D., 4,533,105, Cl. 248-371.000.

D.E.A. Digital Electronic Automation S.p.A.: *See*—
Minucciani, Giorgio; and Sola, Domenico, 4,534,006, Cl. 364-513.000.

D-Two Systems International Inc.: *See*—
Flynn, Stephen D., 4,532,923, Cl. 128-205.130.

Dahlgren, Harold P.; Taylor, James E.; Peters, Dwight W.; and Selby, Donald R., to Dahlgren Manufacturing Company. Variable angle extruder blade surfacing machine. 4,532,735, Cl. 51-56.00R.

Dahlgren, Harold P.; Gardiner, John W.; and Taylor, James E. Coating method. 4,533,563, Cl. 427-387.000.

Dahlgren Manufacturing Company: *See*—
Dahlgren, Harold P.; Taylor, James E.; Peters, Dwight W.; and Selby, Donald R., 4,532,735, Cl. 51-56.00R.

Dahlin, Robert S.: *See*—
Altman, Ralph F.; Gooch, John P.; Dismukes, Edward B.; Bickelhaupt, Roy E.; and Dahlin, Robert S., 4,533,364, Cl. 55-5.000.

Daikoku, Takahiro: *See*—
Hakuraku, Yoshinori; Ogata, Hisanao; Daikoku, Takahiro; and Suzuki, Noboru, 4,532,770, Cl. 62-3.000.

Daimler-Benz Aktiengesellschaft: *See*—
Muller, Alf; Schobbe, Hermann; Loper, Bernd; and Binnewies, Hartmut, 4,533,184, Cl. 301-63.00R.
Wulf, Helmut; and Baehrle, Friedrich, 4,532,894, Cl. 123-142.50E.

Dainippon Ink and Chemicals, Inc.: *See*—
Okoshi, Noboru; and Ikeda, Takenori, 4,533,716, Cl. 528-73.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Yamada, Mitsuhiko, 4,534,059, Cl. 382-54.000.

Daisy Systems Corporation: *See*—
Finegold, Aryeh, 4,533,911, Cl. 340-727.000.

Dallaserra, Arthur B.: *See*—
Bavoux, Guy; and Dallaserra, Arthur B., 4,532,863, Cl. 101-153.000.

Daly, Christopher N.; and Money, David K., to Telectronics Pty. Ltd. On-chip CMOS bridge circuit. 4,533,988, Cl. 363-127.000.

Daly, Christopher N.: *See*—
Crosby, Peter A.; Daly, Christopher N.; Money, David K.; Patrick, James F.; Seligman, Peter M.; and Kuzma, Janusz A., 4,532,930, Cl. 128-419.00R.

Danby, Hal C.; and Ritson, Carl, to Anatros Corporation. Parenteral solution delivery control system. 4,533,350, Cl. 604-253.000.

Danfoss A/S: *See*—
Pedersen, Poul H. H., 4,532,764, Cl. 60-384.000.
Petersen, Hans C.; Kyster, Erik; and Thomsen, Svend E., 4,533,303, Cl. 418-61.00B.

Dappen, Heinz: *See*—
Anderegg, Fredy; Furrer, Josef; and Dappen, Heinz, 4,533,787, Cl. 174-68.500.

Darche, Michel J. P.: *See*—
Lauvray, Georges R. P. L.; and Darche, Michel J. P., 4,533,945, Cl. 358-109.000.

Dargent, Bruno, to Commissariat a l'Energie Atomique. Process for producing conductors for integrated circuits using planar technology. 4,533,431, Cl. 156-643.000.

Darnell, William R.: *See*—
Newland, Gordon C.; and Darnell, William R., 4,533,729, Cl. 528-371.000.

Das, Dilip K.; Kumar, Kaplesh; and Wettstein, Ernest C., to Charles Stark Draper Laboratory, Inc., The. Radial orientation rare earth-cobalt magnet rings. 4,533,407, Cl. 148-102.000.

Daubert Coated Products Inc.: *See*—
Coughlan, Raymond T.; and Bojarski, Suzette M., 4,533,600, Cl. 428-414.000.

Davenport, James M.: *See*—
Wolfe, Allan M.; Davenport, James M.; Theeuwes, Felix; and Yum, Su I., 4,533,348, Cl. 604-85.000.

Davies, James F.; Leigh, Arthur G.; and Rennie, George K., to Lever Brothers Company. Method and device for conditioning fabrics in a tumble-dryer. 4,532,719, Cl. 34-12.000.

Davies, Robert B.: *See—*
Miller, Ira; and Davies, Robert B., 4,533,844, Cl. 307-530.000.

Davis, Bender A.; and Louw, Hendrik A., to Carvalette Services Africa (Proprietary) Limited. Guide rail for sliding assembly. 4,533,173, Cl. 296-216.000.

Day, Eric; and VanDerStuyf, Allen F., to Cummins Engine Company, Inc. Electronically controlled fuel pump. 4,532,893, Cl. 123-41.310.

Dayco Corporation: *See—*
Howerton, Anderson W., 4,533,040, Cl. 198-847.000.
Miranti, Joseph P., Jr.; Oliver, Larry R.; and Johnson, Clyde O., 4,533,342, Cl. 474-201.000.
Wetzel, Robert E., 4,533,420, Cl. 156-138.000.

de Bentzmann, Bertrand L. Device for producing and removing shaped wire material pieces. 4,532,966, Cl. 140-105.000.

Decker, Ronald R.; and Shannon, William T. Vehicle performance detection and recording apparatus. 4,533,962, Cl. 360-5.000.

Deckert, Clinton L., to Warner-Lambert Company. Controller for a dual drug delivery system. 4,533,347, Cl. 604-81.000.

Deere & Company: *See—*
Willer, David A.; Rosbak, John; and McCombs, Daniel G., 4,533,108, Cl. 248-467.000.

DeFalco, Francis: *See—*
Teng, Yu-Ling; McCoy, Charles; DeFalco, Francis; and Mayernick, Richard, 4,533,606, Cl. 428-658.000.

DeFalco, Ralph. Overhead door construction. 4,532,973, Cl. 160-235.000.

Degeilh, Robert, to Saint-Gobain Vitrage. Process for preparing polyvinyl butyral. 4,533,697, Cl. 525-61.000.

Degussa Aktiengesellschaft: *See—*
Drauz, Karlheinz; and Kleemann, Axel, 4,533,766, Cl. 568-771.000.

Dehoff, Barry D.: *See—*
Blair, John J.; Fonvielle, Frank P.; Smith, Richard A.; Dehoff, Barry D.; and Shue, Roger C., 4,533,325, Cl. 433-171.000.

Deininger, Anton; Nelzow, Hartmann; and Farber, Karlheinz, to Bosch-Siemens Hausgeraete GmbH. Variable volume metering valve for dispensing beverage concentrates. 4,533,070, Cl. 222-439.000.

Del Mar Avionics: *See—*
Kelen, George J., 4,532,934, Cl. 128-697.000.

Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, to Institut Francais du Petrole. Process for recovering polymetal compounds discharged from a submarine hydrothermal source and devices for carrying out the same. 4,533,526, Cl. 423-1.000.

Delam, Heinz, to Gerb Gesellschaft fur Isolierung MBH & Co KG. Elastic support unit. 4,533,109, Cl. 248-542.000.

DeLaMater, George B.: *See—*
Milligan, Barton; and DeLaMater, George B., 4,533,763, Cl. 568-716.000.
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Delanese Corporation: *See—*
Choe, Eui W.; and Conciatori, Anthony B., 4,533,725, Cl. 528-336.000.

Del Bon, Franco: *See—*
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Del Bon, Luigi; and Del Bon, Franco. Process for producing a valve-and-lid assembly. 4,532,690, Cl. 29-451.000.

Delta Kogyo Co., Ltd.: *See—*
Otani, Toshiaki; Chihara, Takeshi; and Nishikori, Tsutomu, 4,533,027, Cl. 192-8.00C.

Demco, Inc.: *See—*
Burns, Daniel E., 4,532,774, Cl. 62-239.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Maeda, Tetsuro; Okamoto, Akihiro; Shimizu, Yoshimitsu; and Nomoto, Takashi, 4,533,698, Cl. 525-73.000.

Dennison Manufacturing Company: *See—*
Bourque, Donald L., 4,533,076, Cl. 227-67.000.

Dente, Mario; Porcari, Guiliano; and Robinson, Lee F., to RTR Riotinto Til Holding S.A. Extraction process. 4,533,459, Cl. 208-11.0LE.

Denton, Robert D.: *See—*
Valencia, Jaime A.; and Denton, Robert D., 4,533,372, Cl. 62-12.000.

Dentsply Research & Development Corp.: *See—*
Blair, John J.; Fonvielle, Frank P.; Smith, Richard A.; Dehoff, Barry D.; and Shue, Roger C., 4,533,325, Cl. 433-171.000.

DePalma, Vincent M.; and Ward, Albert W., to International Business Machines Corporation. Stabilized magnetic recording materials and process for tailoring and stabilizing of magnetic recording materials. 4,533,582, Cl. 428-64.000.

de Polo, Harry R. Eccentrically rotatable chair. 4,533,178, Cl. 297-349.000.

de Rham, Abbott B. Gas tight chimney access door and shield for use therewith and chimney assemblies employing same. 4,532,915, Cl. 126-242.000.

Dervan, Andrew H.: *See—*
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,533,534, Cl. 523-436.000.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,533,684, Cl. 523-436.000.

Deschenaux, Warren; Hughes, Gregory; Kreuzer, Justin; and La Fiandra, Carlo, to Perkin-Elmer Corporation, The. Mask ring assembly for X-ray lithography. 4,534,047, Cl. 378-35.000.

Desjardins, Glen R.: *See—*
Desjardins, Wilfred J.; Desjardins, Wayne W.; and Desjardins, Glen R., 4,532,669, Cl. 15-249.000.

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Tortorello, Anthony J.; Hansen, Nestor P.; and Jarocki, Kathryn M., 4,533,682, Cl. 523-414.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Generation of mutation pitches in an electronic musical instrument. 4,532,848, Cl. 84-1.190.

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Prinz, A. F. Rudolf; and Charvat, Rudolf M., 4,532,810, Cl. 73-717.000.

Deutsche Perrot-Bremse GmbH: *See—*
Schneider, Wilhelm, 4,533,022, Cl. 188-18.00R.

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Dodds, David E.; and Bertsch, Ludo A., 4,534,038, Cl. 375-36.000.
Dodds, David E.; and Bertsch, Ludo A., 4,534,039, Cl. 375-36.000.

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Dey, Arabinda N.; and Hamilton, Noble E., to Duracell Inc. Seal for electrochemical cell. 4,533,609, Cl. 429-172.000.

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Dickerson, Douglas M.; and Fikes, Robert W., to United States Steel Corporation. Apparatus and method of using a fuel gas regulator for a coke oven battery. 4,533,439, Cl. 201-41.000.

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Wong, P. K.; and Dickson, Mark K., 4,533,740, Cl. 549-328.000.

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Kluth, Hermann; Roderhoff, Bernhard; Friedemann, Wolfgang; Wegner, Jurgen; and Dierichs, Wolfgang, 4,533,490, Cl. 252-305.000.

Diesel Kiki Co., Ltd.: *See—*
Swain, James C.; and Thomas, David L., 4,533,299, Cl. 417-222.000.

Dietz, Peter W.: *See—*
Snaddon, Robert W. L.; and Dietz, Peter W., 4,533,368, Cl. 55-104.000.

Digital Products Corporation: *See—*
Foley, Steven L.; and Bower, David S., 4,533,141, Cl. 273-86.00C.

Digital Services Corporation: *See—*
Norman, James W., III, 4,533,952, Cl. 358-160.000.

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Lacey, Ralph W., 4,533,281, Cl. 407-36.000.

Dilgren, Richard E.; and Ritter, Paul B., to Shell Oil Company. Selective steam foam soak oil recovery process. 4,532,993, Cl. 166-303.000.

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Di Passio, Attilio; and Pezzulo, Antimo, to Videocolor. Method of manufacture of a color television tube having low screen reflectance for ambient light. 4,533,610, Cl. 430-25.000.

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Beauprey, Richard R., 4,533,830, Cl. 250-231.0SE.

Discovision Associates: *See—*
Smith, William V., 4,534,021, Cl. 369-47.000.

Dismukes, Edward B.: *See—*
Altman, Ralph F.; Gooch, John P.; Dismukes, Edward B.; Bickelhaupt, Roy E.; and Dahlin, Robert S., 4,533,364, Cl. 55-5.000.

Dittmar, Heinz; Beckmann, Manfred; Dorr, Karl-Heinz; Rothe, Ulrich; and Sander, Ulrich, to Metallgesellschaft Aktiengesellschaft. Process of producing sulfuric acid. 4,533,537, Cl. 423-522.000.

Divers Supply Co., Inc.: *See—*
Ostendorf, Larry P., 4,533,256, Cl. 368-111.000.

Dixon, John; and Manning, Peter. Locking toy vehicle. 4,533,336, Cl. 446-465.000.

Doane, Elliott P.: *See—*
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Dobbs, John: *See—*
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.

Dr. Ing. h.c.F. Porsche A.G.: *See—*
Schaible, Walter, 4,532,786, Cl. 72-68.000.

Dr. -Ing. Rudolf Hell GmbH: *See—*
Gall, Winrich; and Weselmann, Peter, 4,533,942, Cl. 358-78.000.

Dr. Johannes Heidenhain GmbH: *See—*
Feichtinger, Kurt, 4,532,713, Cl. 33-559.000.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Haarmann, Walter, 4,533,664, Cl. 514-225.000.

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Fukumoto, Hiroshi; Inoue, Sukejiro; Sasakawa, Masumi; and Doi, Shinji, 4,533,614, Cl. 430-99.000.
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Domoleczny, James D.: *See*—
Cornwell, Ross E., Jr.; Czech, John F.; and Domoleczny, James D., 4,533,105, Cl. 248-371.000.

Donnelly, Edward J.: *See*—
Kinney, Philip C.; Imran, Mir; and Donnelly, Edward J., 4,532,710, Cl. 33-141.00E.

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McLaughlin, James L.; Custer, Donald J.; and Donze, Richard J., 4,532,791, Cl. 72-275.000.
O'Connor, James M.; Lickei, Donald L.; Rosin, Michael L.; and Donze, Richard J., 4,533,717, Cl. 528-78.000.

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Dittmar, Heinz; Beckmann, Manfred; Dorr, Karl-Heinz; Rothe, Ulrich; and Sander, Ulrich, 4,533,537, Cl. 423-522.000.

Dorries, Peter; and Wahl, Helmut, to Cassella Aktiengesellschaft; and Theodor Hymmen KG. Carrier materials coated with amino resin dispersions, and their further processing into laminates. 4,533,590, Cl. 428-211.000.

Dorsey-Palmateer, John W.: *See*—
Baukol, David E.; and Dorsey-Palmateer, John W., 4,533,870, Cl. 324-158.00D.

Dosaka, Shinichi: *See*—
Kurita, Hiroyuki; Kobayashi, Yuko; Dosaka, Shinichi; Kikuchi, Juro; Takase, Hiroshi; and Harada, Kenichi, 4,533,220, Cl. 350-507.000.

Douglas, Ellwood S.: *See*—
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,533,007, Cl. 177-50.000.

Dow Chemical Company, The: *See*—
Bell, David R.; and Miller, Theodore E., Jr., 4,533,643, Cl. 436-178.000.
Chang, Feng-Chih; Wernli, Susan A.; and Busby, David E., 4,533,764, Cl. 568-724.000.
Ishibe, Nobuyuki; Thomas, Renard L.; and Tasset, Emmett L., 4,533,653, Cl. 502-242.000.
Kyriacou, Demetrios; and Brattesani, Donald N., 4,533,454, Cl. 204-272.000.
Miller, Theodore E., Jr.; and Small, Hamish, 4,532,811, Cl. 73-861.050.
Stevens, Rex R., 4,533,508, Cl. 264-22.000.
Turner, James A., 4,533,381, Cl. 71-94.000.
Walles, Wilhelm E.; Keskey, William H.; and Young, Richard G., 4,533,484, Cl. 252-117.000.

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Downes, Gene, administrator: *See*—
Scoccia, Adelmo A.; and Schellin, Donald B., deceased, 4,533,189, Cl. 339-17.0CF.

Downey, William J.; and Brauer, Melvin, to CasChem, Inc. Extended polyurethanes. 4,533,598, Cl. 428-380.000.

Downs, Edgar S. Strap-type wrench for removing rotatable closures or similar members. 4,532,833, Cl. 81-64.000.

Dragone, Corrado, to AT&T Bell Laboratories. Corrugated antenna feed arrangement. 4,533,919, Cl. 343-786.000.

Drauz, Karlheinz; and Kleemann, Axel, to Degussa Aktiengesellschaft. Process for the production of dihydroxybenzenes. 4,533,766, Cl. 568-771.000.

Dresser Industries, Inc.: *See*—
Aves, William L., Jr.; and Aves, Gary A., 4,533,403, Cl. 148-19.000.
Onal, Hasan F., 4,533,294, Cl. 415-119.000.
Wang, Ke-Chin; and Winkelbauer, Howard M., 4,533,646, Cl. 501-97.000.

Drew, Dennis M. Signal shape controller. 4,532,849, Cl. 84-1.220.

Drexore Resources Inc.: *See*—
Panovic, Vlatko, 4,533,116, Cl. 254-26.00R.

Drive Line Service, Inc.: *See*—
Wilson, Louis D.; and Jones, Patrick M., 4,532,804, Cl. 73-478.000.

Drobish, James L., to Procter & Gamble Company, The. Pump-type dispenser. 4,533,069, Cl. 222-209.000.

DSL Dynamic Sciences Limited: *See*—
Boetzkes, Peter C., 4,533,871, Cl. 324-207.000.

Duchesneau, Jerome G., to United Technologies Corporation. Pitch control system for variable pitch propeller. 4,533,295, Cl. 416-27.000.

Duchesneau, Jerome G.; and Schwartz, Robert A., to United Technologies Corporation. Pitch control system for variable pitch propeller. 4,533,296, Cl. 416-46.000.

Duffy, Patrick J.: *See*—
Puckowski, Robert T.; Cooper, Dennis; and Duffy, Patrick J., 4,533,417, Cl. 156-51.000.

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Walls, John E.; and Dunder, Thomas A., 4,533,620, Cl. 430-157.000.

Dunlop Limited: *See*—
Moore, Alan F., 4,533,274, Cl. 403-31.000.

Duparchy, Jacques. Process of formation of an image of the eye free from reflections for its recording by picture taking and/or its observation and apparatus for putting into action of the process. 4,533,223, Cl. 351-206.000.

Du Pont de Nemours, E. I., and Company: *See*—
Fryd, Michael; and Merriman, Burt T., Jr., 4,533,574, Cl. 427-385.500.
Peterson, Marvin L., 4,533,761, Cl. 568-673.000.
Squire, Edward N., 4,533,741, Cl. 549-455.000.

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Dey, Arabinda N.; and Hamilton, Noble E., 4,533,609, Cl. 429-172.000.

Durr, Dieter; Rohr, Otto; and Bohner, Beat, to Ciba-Geigy Corporation. Herbicidal heterocyclic esters of 2-nitro-5-(o-chloro-p-trifluoromethylphenoxy)-benzoic acid as compositions and herbicidal method. 4,533,380, Cl. 71-88.000.

Dwulet, Michaelene, to Multi-Tex Products Corp. Adhesive for composite yarn product. 4,533,597, Cl. 428-375.000.

Dyer, Richard J.; and Tarpiey, Robert S., to Diamondback Marine Products, Inc. Boat anchor. 4,532,880, Cl. 114-298.000.

Dykast, Jaroslav: *See*—
Marsicek, Zdenek; Janeba, Jaroslav; Pacha, Antonin; Pastrnak, Ales; Dykast, Jaroslav; and Prazak, Roman, 4,534,042, Cl. 377-16.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Neuschaeffer, Karl H.; Spielau, Paul; Zoche, Gunter; and Engels, Hans-Werner, 4,533,393, Cl. 106-18.120.

E. R. Squibb & Sons, Inc.: *See*—
Gordon, Eric M.; and Ondetti, Miguel A., 4,533,660, Cl. 514-210.000.
Jensen, Ole R., 4,533,354, Cl. 604-323.000.
Karanewsky, Donald S., 4,533,661, Cl. 514-212.000.
Nakane, Masami, 4,533,673, Cl. 514-469.000.

Eagle Machinery Company: *See*—
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,533,007, Cl. 177-50.000.

Eagles, Brian A.: *See*—
French, Albert G.; and Eagles, Brian A., 4,533,180, Cl. 299-1.000.

Eakin, Murdoch A.; Hayter, Anthony J.; and Furr, Barrington J. A., to Imperial Chemical Industries plc. Amino, cyano phenylthio or phenoxyl indole derivatives. 4,533,672, Cl. 514-415.000.

Eastman Kodak Company: *See*—
Lu, Wei C., 4,533,229, Cl. 355-3.0DD.
Newland, Gordon C.; and Darnell, William R., 4,533,729, Cl. 528-371.000.

Easton, Thomas C., to Tektronix, Inc. Method for simultaneously cutting a plurality of circuit boards. 4,532,839, Cl. 83-29.000.

Eaton Corporation: *See*—
Begley, Benjamin D., 4,533,302, Cl. 418-61.00B.
Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., 4,533,783, Cl. 136-249.000.

Eberspacher, Rolf: *See*—
Buchner, Norbert; Eberspacher, Rolf; and Liede, Dieter, 4,533,063, Cl. 220-270.000.

Ebigt, Joachim: *See*—
Hermann, Hans D.; Fabian, Klaus; and Ebigt, Joachim, 4,533,601, Cl. 428-437.000.

Eby, John E.; and Kingston, Charles M., to GTE Products Corporation. Video measurement system for microcomputer. 4,533,944, Cl. 358-107.000.

Ecer, Gunes M., to CDP, Ltd. Self sharpening drag bit for sub-surface formation drilling. 4,533,004, Cl. 175-329.000.

Ecer, Gunes M., to Smith International, Inc. Process for treating a bearing surface to modify microasperities. 4,533,815, Cl. 219-121.0LF.

Eckert, Alton B.; and Nambudiri, Easwaran C. N., to Pitney Bowes Inc. Non-volatile memory protection circuit with microprocessor interaction. 4,534,018, Cl. 365-228.000.

Eckhardt, Wolfgang; and Kunz, Walter, to Ciba-Geigy Corporation. Microbicidal 2-(1H-1,2,4-triazolylmethyl-1'-yl)-2-siloxy-2-phenylacetates. 4,533,659, Cl. 514-184.000.

Edelman, Robert D. Latching system. 4,533,165, Cl. 292-68.000.

Eguchi, Yasukata; and Inamori, Mikio, to Janome Sewing Machine Co. Ltd. Hem stitching presser foot for a zigzag sewing machine. 4,532,874, Cl. 112-235.000.

Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, to BASF Aktiengesellschaft. Electrophotographic recording materials containing special charge carrier-transporting compounds. 4,533,612, Cl. 430-59.000.

EIP Microwave, Incorporated: *See*—
Witczak, Edward J., 4,533,867, Cl. 324-78.00R.

Eisai Co., Ltd.: *See*—
Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, 4,532,881, Cl. 118-20.000.
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.

Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, 4,533,669, Cl. 514-396.000.

Eke, Kenneth I., to Microwave Ovens Limited. Microwave ovens and methods of cooking food. 4,533,809, Cl. 219-10.55M.

Electric Power Research Institute, Inc.: *See*—
Altman, Ralph F.; Gooch, John P.; Dismukes, Edward B.; Bickelhaupt, Roy E.; and Dahlin, Robert S., 4,533,364, Cl. 55-5.000.

Eli Lilly and Company: *See*—
Buddenbaum, Harry C.; and Robison, Robert L., 4,533,542, Cl. 424-31.000.
Matsumoto, Ken; and Ward, John S., 4,533,666, Cl. 514-277.000.
Robertson, David W., 4,533,670, Cl. 514-399.000.
Robertson, David W., 4,533,734, Cl. 514-303.000.
Spry, Douglas O., 4,533,497, Cl. 260-239.00A.

Elka, Shmuel: *See*—
Satran, Amir; and Elka, Shmuel, 4,533,283, Cl. 407-111.000.

Elliott, Thomas; and Knecht, Todd, to Elliott, Thomas. Surface removal silo unloaders. 4,533,280, Cl. 406-57.000.

Eloranta, Vaito K.; Peisach, Joel M.; and Rogers, Donald E., Jr., to Polaroid Corporation. Apparatus for exchanging an intensifying screen and a negative in a film packet. 4,534,053, Cl. 378-167.000.

Elton, Richard K.; and Schultz, William R., Jr., to General Electric Company. Formulation for electrodeposition of mica. 4,533,694, Cl. 524-449.000.

Emerson Electric Co.: *See*—
Stackhouse, James L., Jr., 4,532,841, Cl. 83-102.100.

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White, Maurice A.; Riggle, Peter; and Emigh, Stuart G., 4,532,766, Cl. 60-517.000.

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Anderson, William J., 4,532,672, Cl. 16-86.00A.

Endo, Toshio, to Nissan Motor Company, Limited. Resilient structure for securing carpeting of different thicknesses. 4,532,671, Cl. 16-7.000.

Engebretson, Marvin: *See*—
Hallock, Donald W.; Hartmann, Thomas M.; and Engebretson, Marvin, 4,533,075, Cl. 227-55.000.

Engel, Kurt: *See*—
Hargassner, Reinhard; Nugent, Thomas J.; Scheinecker, Alois; and Engel, Kurt, 4,532,981, Cl. 164-483.000.

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Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Haarmann, Walter, 4,533,664, Cl. 514-225.000.

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Tiemann, Jerome J.; and Engeler, William E., 4,533,936, Cl. 358-12.000.

Engelmore, Anthony R. Rotatable electrical connector for telephone cord. 4,533,796, Cl. 179-186.000.

Engels, Hans-Werner: *See*—
Neuschaeffer, Karl H.; Spielau, Paul; Zoche, Gunter; and Engels, Hans-Werner, 4,533,393, Cl. 106-18.120.

Engwall, Mats A.; and Mulvany, Richard B., to International Business Machines Corporation. Cylindrical type squeeze bearing systems with bearing and driving elements attached in areas of maximum deflection. 4,533,186, Cl. 308-5.00R.

Ennis, Gregory B.: *See*—
McNamara, Robert P.; Ennis, Gregory B.; Feiertag, Richard J.; and Bauer, Robert K., 4,533,948, Cl. 358-122.000.

Enomoto, Hiroshi: *See*—
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Kura, Kohei; Yagi, Masahiro; and Shirahase, Ichiro, 4,533,668, Cl. 514-321.000.

Ensor, Paul M. D.; and Bassett, Neville C., to Broken Hill Proprietary Company Limited, The. Centrifugal separation method and apparatus. 4,533,468, Cl. 209-172.000.

Eppendorf Geratebau Netheler & Hinz GmbH: *See*—
Gronholz, Claus; and Schmidt-Rabenau, Hartmut, 4,533,255, Cl. 366-108.000.

Epson Corporation: *See*—
Takahashi, Shunetsu, 4,533,924, Cl. 346-49.000.

Epworth, Richard E., to International Standard Electric Corporation. Optical transmission system. 4,533,247, Cl. 356-345.000.

Erickson, Donald C. Cryogenic air separation with cold argon recycle. 4,533,375, Cl. 62-22.000.

Eskinazi, Victoria: *See*—
Wells, James E.; and Eskinazi, Victoria, 4,533,758, Cl. 658-630.000.

Esper, Friedrich J.; and Zeller, Robert, to Robert Bosch GmbH. High strength sintered alloy. 4,533,392, Cl. 75-230.000.

Esper, Norbert: *See*—
Burba, Christian; Goeke, Ulrich; and Esper, Norbert, 4,533,524, Cl. 427-372.200.

Estel Hoogovens B.V.: *See*—
Bruinsma, Hans; Hollander, Frans; Huisman, Rein L.; and Reinen, Adrianus G., 4,532,789, Cl. 72-202.000.

Ethicon, Inc.: *See*—
Aday, Jorge L.; and Cerwin, Robert J., 4,533,041, Cl. 206-63.300.
Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,532,928, Cl. 128-335.500.
Mattei, Frank V.; and Regula, Donald W., 4,532,929, Cl. 128-335.500.
Miksza, Anthony, Jr., 4,532,927, Cl. 128-334.00C.
O'Holla, Robert H., 4,532,926, Cl. 128-334.00C.

Ethyl Corporation: *See*—
McKinnie, Bonnie G.; and Ranken, Paul F., 4,533,753, Cl. 568-47.000.
Walter, Thomas J., 4,533,735, Cl. 546-156.000.

Etzbach, Karl-Heinz: *See*—
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, 4,533,612, Cl. 430-59.000.

Europaisches Laboratorium fur Molekularbiologie (EMBL): *See*—
Ansorge, Wilhelm, 4,533,307, Cl. 425-90.000.

Evans, David L. Lifting and transporting devices. 4,533,009, Cl. 177-139.000.

Evans, Jack L.; Campbell, Karen J.; Kreil, Curtis L.; and Sidney, LuAnn, to Minnesota Mining and Manufacturing Company. Electron-beam adhesion-promoting treatment of polyester film base for silicone release liners. 4,533,566, Cl. 427-44.000.

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Everede Tool Company: *See*—
Jorgensen, Charles A., 4,533,285, Cl. 408-191.000.

Ex-Cell-O Corporation: *See*—
Hagemeyer, Kenneth L.; and Pearson, Vernon W., 4,533,287, Cl. 409-234.000.

Exxon Production Research Co.: *See*—
Ortloff, John E., 4,532,879, Cl. 114-230.000.
Valencia, Jaime A.; and Denton, Robert D., 4,533,372, Cl. 62-12.000.

Exxon Research & Engineering Co.: *See*—
Michaelson, Robert C.; and Austin, Richard G., 4,533,772, Cl. 568-860.000.
Michaelson, Robert C.; and Austin, Richard G., 4,533,773, Cl. 568-860.000.
Moustakas, Theodore D., 4,533,450, Cl. 204-192.00S.

Fabbri, Bruno; and Fausone, Alfredo, to SIP - Societa Italiana per L'Esercizio Telefonico p.A. Electronic instrument for measuring the overall phase and amplitude distortion of a transmission channel. 4,533,868, Cl. 324-83.00R.

Fabian, Klaus: *See*—
Hermann, Hans D.; Fabian, Klaus; and Ebigt, Joachim, 4,533,601, Cl. 428-437.000.

Fabricated Metals, Inc.: *See*—
Coleman, Clarence B., 4,532,800, Cl. 73-308.000.

Fair, Marjorie A. Loose-fitting ostomy garment. 4,533,355, Cl. 604-345.000.

Falamak, Reza. Control apparatus for omnidirectional, polar coordinated platform for lawnmower and the like. 4,533,998, Cl. 364-424.000.

Falckenberg, Richard: *See*—
Grabmaier, Josef; Falckenberg, Richard; and Foll, Helmut, 4,533,428, Cl. 156-608.000.

Fang, Frank F.; Grossman, Bertrand M.; and Hwang, Wei, to International Business Machines Corporation. Method of making ultrashort FET using oblique angle metal deposition and ion implantation. 4,532,698, Cl. 29-571.000.

Fanuc Ltd.: *See*—
Kishi, Hajimu; Seki, Masaki; and Kawasumi, Masashi, 4,533,286, Cl. 409-80.000.
Nozawa, Ryoichiro; and Kiya, Nobuyuki, 4,534,001, Cl. 364-474.000.

Farber, Karlheinz: *See*—
Deininger, Anton; Nelzow, Hartmann; and Farber, Karlheinz, 4,533,070, Cl. 222-439.000.

Farmer, Douglas A., Jr.: *See*—
Trotz, Samuel I.; and Farmer, Douglas A., Jr., 4,533,736, Cl. 546-290.000.

Farrell, George; Anderson, Diana M.; and Walton, Michael E., to Interox Chemicals Limited. Tungsten recovery from carbides. 4,533,527, Cl. 423-53.000.

Fatur, Thomas C.: *See*—
Bossart, Clayton J.; and Fatur, Thomas C., 4,533,520, Cl. 422-96.000.

Fausone, Alfredo: *See*—
Fabbri, Bruno; and Fausone, Alfredo, 4,533,868, Cl. 324-83.00R.

FDX Patents Holding Company, N.V.: *See*—
Rotem, Abraham I., 4,533,412, Cl. 148-411.000.

Fedde, Mickiel P., to Minnesota Mining and Manufacturing Co. Apparatus for converting facsimile coded data to video data. 4,533,956, Cl. 358-260.000.

Feichtinger, Kurt, to Dr. Johannes Heidenhain GmbH. Multicoordinate sensing head. 4,532,713, Cl. 33-559.000.

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McNamara, Robert P.; Ennis, Gregory B.; Feiertag, Richard J.; and Bauer, Robert K., 4,533,948, Cl. 358-122.000.

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Feist, Norbert, to Battenfeld Maschinenfabrik GmbH. Mixing nozzle for two reactant components. 4,533,521, Cl. 422-133.000.

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Feldman, Steven; and Cihak, Richard J., to AMP Incorporated. Connector for printed circuit boards. 4,533,203, Cl. 339-176.00M.

Fellows Corporation: *See*—
Tlaker, Erich, 4,533,858, Cl. 318-634.000.

Ferag AG: *See*—
Meier, Jacques, 4,532,750, Cl. 53-118.000.

Fergin, Richard L.: *See—*
Neuzil, Richard W.; and Fergin, Richard L., 4,533,398, Cl. 127-55.000.
Fermanich, Raymond J., to Barber-Colman Company. Transducer utilizing electrical and pneumatic signals. 4,532,951, Cl. 137-84.000.
Ferrell, David R. Grounding wire clamping device. 4,533,102, Cl. 248-74.100.
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Louw, John A., 4,533,345, Cl. 604-43.000.
Field, Richard E., to National Research Development Corporation. Endoprosthetic bone joint devices. 4,532,660, Cl. 623-18.000.
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Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., 4,533,762, Cl. 568-677.000.
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Dickerson, Douglas M.; and Fikes, Robert W., 4,533,439, Cl. 201-41.000.
Fillman, Russell E., to Woodford Manufacturing Company. Wall hydrant. 4,532,954, Cl. 137-302.000.
FILMOSTO-PROJEKTION Johannes Jost GmbH & Co.: *See—*
Klose, Odo; and Jost, Jochen, 4,532,727, Cl. 40-152.000.
Fincher, Jeffrey L., to Texas A&M University. Optical joystick. 4,533,827, Cl. 250-211.00K.
Finegold, Aryeh, to Daisy Systems Corporation. Video display system for displaying symbol-fragments in different orientations. 4,533,911, Cl. 340-727.000.
Finnan, Jeffrey L.: *See—*
Schmidt, Douglass N.; Finnan, Jeffrey L.; and Lisa, Rudolph E., 4,533,674, Cl. 514-474.000.
Finnemore, Douglas K.: *See—*
Verhoeven, John D.; Gibson, Edwin D.; Finnemore, Douglas K.; Ostenson, Jerome E.; Schmidt, Frederick A.; and Owen, Charles V., 4,532,703, Cl. 29-599.000.
Finney, Roy P., to Medical Engineering Corporation. Penile implant. 4,532,920, Cl. 128-79.000.
Firestone Tire & Rubber Company, The: *See—*
Beneze, Heinz W.; and Tomaszewski, Walter, 4,532,744, Cl. 52-222.000.
Firey, Joseph C. Cyclic char gasifier with product gas divider. 4,533,362, Cl. 48-61.000.
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Leivenzon, Simon; and Leivenzon, Steven, 4,533,905, Cl. 340-524.000.
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Jackman, Peter R.; and Thomas, Alan D., 4,533,801, Cl. 200-61.45R.
Fischer, Reinhard, to Siemens Aktiengesellschaft. Digital FSK demodulator using non-recursive transversal filter. 4,533,874, Cl. 329-50.000.
Fisher Controls International, Inc.: *See—*
Walton, Herbert H.; and Kehoe, Steven D., 4,532,961, Cl. 137-625.310.
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Sukonick, Josef; and Fjallstam, Bjorn M., 4,533,910, Cl. 340-721.000.
Flair, Henry J.: *See—*
Rayburn, Charles C.; Padgitt, Howard R.; and Flair, Henry J., 4,533,813, Cl. 219-121.0LH.
Flanagan, Eugene L., III: *See—*
Foldvari, Tibor L.; Boucher, Donald R.; and Flanagan, Eugene L., III, 4,533,926, Cl. 346-136.000.
Fleishman, Gregg. Portable furniture. 4,533,174, Cl. 297-16.000.
Fleming, Ray D. Bottle holder. 4,533,051, Cl. 206-563.000.
Flesher, Robert W. Pipette system. 4,532,805, Cl. 73-863.320.
Fletcher, Gerald M.; Jacobs, Robert M.; and Pietrowski, Kenneth W., to Xerox Corporation. Pin charging device for use in xerography. 4,533,230, Cl. 355-3.0CH.
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Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,533,900, Cl. 340-52.00R.
Floyd, William M., to United Technologies Automotive, Inc. Vehicle multiplex system having protocol/format for secure communication transactions. 4,534,025, Cl. 370-85.000.
Flynn, Stephen D., to D-Two Systems International Inc. Air bag. 4,532,923, Cl. 128-205.130.
Focqueur, Herve , to Valeo. Valve device for a hydraulic circuit. 4,532,768, Cl. 60-585.000.
Foggini, Giovanni, to Lear S.n.c. Swivel connector for securing motor-vehicle sun visors. 4,533,275, Cl. 403-165.000.
Foldvari, Tibor L.; Boucher, Donald R.; and Flanagan, Eugene L., III, to American Home Products Corporation (Del.). Strip chart recorder and medium status. 4,533,926, Cl. 346-136.000.
Foley, Steven L.; and Bower, David S., to Digital Products Corporation. Gaming apparatus with color sensitive detector. 4,533,141, Cl. 273-86.00C.
Foll, Helmut: *See—*
Grabmaier, Josef; Falckenberg, Richard; and Foll, Helmut, 4,533,428, Cl. 156-608.000.
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Blair, John J.; Fonvielle, Frank P.; Smith, Richard A.; Dehoff, Barry D.; and Shue, Roger C., 4,533,325, Cl. 433-171.000.
Forberg, Horst; Achtnig, Klaus-Peter; Hegner, Gunter; and Boes, Gerhard, to KRONE GmbH. Device for making a solderless, non-screwed and unstripped single or multiple contact at a terminal element. 4,533,196, Cl. 339-97.00P.
Ford Motor Company: *See—*
Alexander, Delores J.; Kurple, Kenneth R.; and Kordomenos, Panagiotis I., 4,533,704, Cl. 525-440.000.
Beim, Rudolf, 4,532,827, Cl. 74-745.000.
Buglione, Arthur J.; and Coats, James M., 4,532,907, Cl. 123-490.000.
Cassatta, Joseph C.; and Chattha, Mohinder S., 4,533,681, Cl. 523-400.000.
Forsting, Bernd; Zander, Joachim; and Gustav, Jeske, 4,533,081, Cl. 237-12.30B.
Janssen, Lutz J.; and Wulfing, Friedl W., 4,533,168, Cl. 296-1.00S.
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Rauthmann, Axel; and Pietsch, Harry, 4,533,169, Cl. 296-37.200.
Salazar, Sumorfin, 4,532,675, Cl. 16-335.000.
Theodore, Ares N.; and Chattha, Mohinder S., 4,533,695, Cl. 524-504.000.
Forest Laboratories, Inc.: *See—*
Blank, Izhak, 4,533,540, Cl. 424-28.000.
Forgac, John M.: *See—*
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Fork, Inc.: *See—*
Albright, Ronald G.; and Albright, William D., 4,533,143, Cl. 273-144.00B.
Formers of Houston, Inc.: *See—*
Hokanson, Ronald A., 4,532,754, Cl. 53-451.000.
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Forsting, Bernd; Zander, Joachim; and Gustav, Jeske, to Ford Motor Company. Heating and ventilation system for vehicles. 4,533,081, Cl. 237-12.30B.
Fortune, William S. Vacuum booster and filter. 4,532,670, Cl. 15-314.000.
Foster, Kenneth W. S., to Renold Plc, A British Company of Renold House. Selectively operative multi-displacement pump or motor. 4,532,854, Cl. 91-472.000.
Foster, Leslie W. Pump. 4,533,301, Cl. 417-437.000.
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Guzdar, Adi R., 4,533,289, Cl. 414-217.000.
Fox, Joseph R.; Pesa, Frederick A.; and Curatolo, Benedict S., to Standard Oil Company, The. Process for the upgrading of lower alcohols to higher molecular weight alcohols. 4,533,775, Cl. 568-905.000.
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Guigon, Jean-Paul, 4,533,128, Cl. 269-58.000.
Francart, Armand, Jr. Compact high torque rotary valve operator for simultaneous actuation of multiple rotary valves. 4,533,113, Cl. 251-63.400.
Frank, Berthold; Gartner, Georg; and Lydtin, Hans, to U.S. Philips Corporation. Method of manufacturing a thermionic cathode and thermionic cathode manufactured by means of said method. 4,533,852, Cl. 313-346.0DC.
Frank, Ed, to Boeing Company, The. Energy absorber for high energy fluid jet. 4,532,949, Cl. 137-1.000.
Frank, Walter, to Burndy Corporation. Collapsible wedge for electrical connector. 4,533,205, Cl. 339-247.000.
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Vroomen, Albert, 4,532,683, Cl. 26-10.00C.
Frederick, John C., to Pirelli Cable Corporation. Apparatus for maintaining level of liquid-gas interface in a vulcanizing tube. 4,533,306, Cl. 425-71.000.
Freitag, Dieter; Bottenbruch, Ludwig; and Schmidt, Manfred, to Bayer Aktiengesellschaft. Aromatic polyester carbonates having a high notched impact strength and a process for the production thereof. 4,533,702, Cl. 525-439.000.
French, Albert G.; and Eagles, Brian A., to Coal Industry (Patents) Ltd. Fluid supply system for rotary cutter heads for mining equipment and to mining machines comprising rotary cutter heads having fluid supply systems. 4,533,180, Cl. 299-1.000.
French, Kenneth; Kocher, Robert C.; Piorkow, Alfred; Shaner, Kenneth; and Smith, J. Thomas, to GTE Products Corporation. Apparatus and process for automatically measuring aperture size of apertured material. 4,533,251, Cl. 356-384.000.
Freyberger, Laurin C.: *See—*
Sauer, Wolfgang; Schmidtpott, Friedrich; Schat, Hermanus; and Freyberger, Laurin C., 4,533,879, Cl. 331-1.00A.
Fricker, Siegfried. Anchoring track with removable filler body. 4,532,740, Cl. 52-98.000.
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Coenen, Hubert; and Kriegel, Ernst, 4,532,992, Cl. 166-267.000.
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Kluth, Hermann; Roderhoff, Bernhard; Friedemann, Wolfgang; Wegner, Jurgen; and Dierichs, Wolfgang, 4,533,490, Cl. 252-305.000.

Friedrich, Peter: *See*—
Witter, Karl-Theo; Friedrich, Peter; and Strole, Ulrich, 4,533,515, Cl. 422-26.000.
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Goldmann, Gerd; Spott, Georg; and Frohlich, Christian, 4,533,432, Cl. 159-47.100.
Fruchey, Melvin C.; and Kubicki, Michael J., to Owens-Illinois, Inc. Dual carton. 4,533,052, Cl. 206-602.000.
Fryd, Michael; and Merriman, Burt T., Jr., to Du Pont de Nemours, E. I., and Company. Polyimide coating compositions of esterified anhydride and aromatic amine mixture. 4,533,574, Cl. 427-385.500.
Fryer, Richard B.: *See*—
Boord, Warren T.; and Fryer, Richard B., 4,533,872, Cl. 324-252.000.
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Yoden, Yoshimasa; Okuda, Tsuneo; Fuchigami, Eiji; and Kuwabara, Toshihiro, 4,533,358, Cl. 8-94.200.
Fuchs, Peter; Mueller-Glaser, Klaus; Schuett, Dieter; and Wach, Wolfgang, to Siemens Aktiengesellschaft. Programmable logic array. 4,534,008, Cl. 364-716.000.
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Ichijima, Seiji; and Hirose, Takeshi, 4,533,625, Cl. 430-552.000.
Ikeda, Kensuke; and Nakamura, Sukenori, 4,533,929, Cl. 346-209.000.
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,533,613, Cl. 430-78.000.
Oda, Kazutaka; Ohba, Hisao; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,533,444, Cl. 204-129.430.
Okita, Tsutomu, 4,533,565, Cl. 427-44.000.
Ono, Shigetoshi; Harada, Toru; Suzuki, Hirohisa; Tanaka, Mitsugu; and Nakamura, Shigeru, 4,533,626, Cl. 430-562.000.
Shiga, Koji, 4,533,225, Cl. 354-322.000.
Takahashi, Osamu; and Tanaka, Mitsugu, 4,533,622, Cl. 430-218.000.
Urata, Yukihide; Moriuchi, Shigenori; Nakamura, Taku; and Ogawa, Masashi, 4,533,623, Cl. 430-309.000.
Yoshida, Tuneo; Oishi, Kengo; and Yagi, Motohiko, 4,533,968, Cl. 360-130.210.
Fuji Xerox Co., Ltd.: *See*—
Miyazaki, Seikichi, 4,533,238, Cl. 355-68.000.
Watai, Yuji; Yasui, Hirokazu; Hirayama, Yoshiyuki; and Matsuura, Akira, 4,533,234, Cl. 355-14.00D.
Yoshino, Masaki, 4,532,865, Cl. 101-426.000.
Fujii, Takashi; Ushizawa, Jisaburo; and Watanabe, Masayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Heating resistor of single crystal manufacturing apparatus. 4,533,822, Cl. 219-553.000.
Fujikawa, Masaki, to Yasui Sangyo Co., Ltd. Warning means for a safety valve of a hydraulic power unit and a hydraulic power unit having the same. 4,533,908, Cl. 340-626.000.
Fujimoto, Takako: *See*—
Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, 4,533,669, Cl. 514-396.000.
Fujimura, Naoto; Sonobe, Akihiro; Yoshihara, Toshiyuki; Takebayashi, Norie; Tanaka, Takashi; and Kuribayashi, Masaki, to Canon Kabushiki Kaisha. Electrophotographic process. 4,533,232, Cl. 355-3.00R.
Fujimura, Yasushi; Okada, Takashi; and Yamagiwa, Kazuo, to Sony Corporation. Subscription television system. 4,533,949, Cl. 358-122.000.
Fujinami, Yoshio; Itoyama, Katumi; and Ochiai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Manual operating device for a slide type electrical device. 4,533,805, Cl. 200-304.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Obata, Saburo; and Ito, Kazuo, 4,533,273, Cl. 401-190.000.
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,533,738, Cl. 548-194.000.
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Yasuhara, Hiroshi; Fujita, Hitoshi; and Okazaki, Kiyoshi, 4,533,946, Cl. 358-111.000.
Fujita, Tadashi: *See*—
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Fujita, Toshio, to Nippon Electric Co., Ltd. Diode driver circuit having stored charge control means. 4,533,838, Cl. 307-270.000.
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Fukuda, Kazumasa; and Kitahara, Yoshimi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,533,603, Cl. 428-458.000.
Fukui, Masahiro; Kitano, Kisei; Tanaka, Masami; and Goto, Yasuyuki, to Chisso Corporation. Pyrimidine derivatives. 4,533,488, Cl. 252-299.610.
Fukumoto, Hiroshi; Inoue, Sukejiro; Sasakawa, Masumi; and Doi, Shinji, to Canon Kabushiki Kaisha. Heat-fixable dry system toner. 4,533,614, Cl. 430-99.000.
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Fukumura, Seisuke: *See*—
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Fukushima, Kenichi: *See*—
Inoue, Hiroshige; Fukushima, Kenichi; and Nishiguchi, Ikuzo, 4,533,732, Cl. 544-172.000.
Fuller, Timothy J.: *See*—
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van den Elzen, Lambertus W. A.; van der Wouden, Adriaan; and Meijer, Auke, 4,533,279, Cl. 405-239.000.
Funke, Michael J.; Topliffe, Douglas A.; and Rathbun, Donald J., to Honeywell Information Systems Inc. Diskette read data recovery system. 4,534,044, Cl. 375-120.000.
Funke, Rolf: *See*—
Gleichaut, Winfried; Gunther, Oswin; Hoffmann, Dietrich; and Funke, Rolf, 4,532,868, Cl. 102-527.000.
Furgerson, Donald F., to Westinghouse Electric Corp. Computer monitored or controlled system which may be modified and debugged on-line by one not skilled in computer programming. 4,533,997, Cl. 364-200.000.
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Eakin, Murdoch A.; Hayter, Anthony J.; and Furr, Barrington J. A., 4,533,672, Cl. 514-415.000.
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Pitzele, Barnett S.; Yu, Stella S. T.; Hamilton, Robert W.; and Moormann, Alan E., 4,533,739, Cl. 548-559.000.
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Johnson, A. Neil; and Taylor, Philip A., 4,533,423, Cl. 156-359.000.
Gabriel, Albert L. Clutch actuating system. 4,533,030, Cl. 192-0.052.
Gaku, Morio; Kimbara, Hidenori; Ayano, Satoshi; and Yoshimura, Susumu, to Mitsubishi Gas Chemical Company, Inc. Process for producing a curable resin from cyanate ester compound and unsaturated 1,2-epoxy compound. 4,533,727, Cl. 528-361.000.
Gal, Jozsef; Gyarfas, Andras; Katko , Laszlo ; Racz, Gabor; Sarlos, Agoston; and Vozari, Gyula, to Budapesti Muszaki Egyetem; and Ikarus Karosszeria es Jarmugyar. Equipment for displaying alphanumerical and/or pictorial information, preferably for use on a vehicle. 4,533,912, Cl. 340-783.000.
Gall, Winrich; and Weselmann, Peter, to Dr. -Ing. Rudolf Hell GmbH. Method and apparatus for reproducing an image which has a coarser resolution than utilized in scanning of the image. 4,533,942, Cl. 358-78.000.
Galloway, Dudley L.: *See*—
Borgmeyer, Virgil L.; Galloway, Dudley L.; Sonnenberg, Gary N.; Gruczka, Jan S.; and Owen, Timothy C., 4,533,786, Cl. 174-50.000.
Galster, Hans-Peter, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Mechanism for the lateral alignment of sheets in a printing machine. 4,533,134, Cl. 271-240.000.
Gamblin, Rodger L., to Burlington Industries, Inc. Practical amorphous iron electroform and method for achieving same. 4,533,441, Cl. 204-3.000.
Gambro Cardio AB: *See*—
Johnsson, Bo A.; Losell, Ingvar E.; and Palmqvist, Sune H., 4,533,516, Cl. 422-46.000.
Gant, Lawrence A., to United States of America, Army. Military wheel-tire assembly. 4,533,183, Cl. 301-37.0TC.
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Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,533,244, Cl. 356-71.000.
Garcia, Philippe; and Seigneurin, Michel, to Micro-Mega. Dental instrument light. 4,533,322, Cl. 433-29.000.
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Tobey, William H.; Thomas, Donald A.; and Gardner, William J., 4,532,674, Cl. 16-295.000.
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Benedict, Gary F., 4,533,400, Cl. 148-4.000.
Mongia, Hukam C.; Coleman, Edwin B.; and Bruce, Thomas W., 4,532,762, Cl. 60-39.230.
Garsin, Paul A., to Xerox Corporation. Charge particle removal device. 4,533,236, Cl. 355-15.000.
Gartner, Georg: *See*—
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Gartner, Karl, to Yoshida Kogyo K. K. Corner joint means for use in wall structure of buildings. 4,532,746, Cl. 52-276.000.
Gatton, James W. Variable-width-beam light apparatus. 4,533,984, Cl. 362-232.000.
Gatz, Ronald: *See*—
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.
Gauthier, Alfred J. Discharge control attachment for a combine harvester. 4,532,941, Cl. 130-27.00R.
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Bourdillot, Michel; Gauthier, Andre ; Maille , Jacques; and Pitault, Bernard, 4,532,699, Cl. 29-572.000.
Gazzarrini, Vinicio, to Solis S.r.l. Process and a machine for the automatic transfer of pantyhose from a machine which produces a pan-

tyhose with seams to a gusset-sewing machine. 4,532,875, Cl. 112-262.200.

Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, to Rheinisch-Westfallisches Elektrizitatswerk Aktiengesellschaft. Carboxylic acid activated dry calcium absorbent method for removing sulfur dioxide from a flue gas. 4,533,532, Cl. 423-244.000.

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Lederle, Franz, 4,533,901, Cl. 340-52.00R.

Gebruder Sulzer Aktiengesellschaft: *See*—
Lerch, Hansueli, 4,532,964, Cl. 139-435.000.

Gee, Gary W.; Shumate, Daniel L.; Nieder, John J.; Bump, Boyd E.; and Kource, Robert D., to United States of America, Army. Detonation products catcher. 4,532,815, Cl. 73-864.630.

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Gelardi, Paul J.; and MacLeod, Robert B., Jr., to Shape Inc. Tape cassette dust door spring assembly and method for assembling same. 4,533,093, Cl. 242-197.000.

General Dynamics Pomona Division: *See*—
Scoccia, Adelmo A.; and Schellin, Donald B., deceased, 4,533,189, Cl. 339-17.0CF.

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Bolon, Donald A.; Gorczyca, Thomas B.; and Hallgren, John E., 4,533,504, Cl. 260-463.000.
Bonini, Bruno; Cook, Raymond G.; Holdren, Carl F.; and Johnston, Everett A., 4,533,098, Cl. 244-110.00B.
Campbell, John R.; and Thackeray, James W., 4,533,722, Cl. 528-199.000.
Elton, Richard K.; and Schultz, William R., Jr., 4,533,694, Cl. 524-449.000.
Harmon, Larry R.; Reiche, John C.; Bowles, Howard R.; and Chiu, Norman H., 4,533,810, Cl. 219-10.55B.
Herberling, Paul V., 4,533,314, Cl. 431-4.000.
Huseby, Irvin C.; and Bobik, Carl F., 4,533,645, Cl. 501-96.000.
Jones, Dwight V., 4,533,986, Cl. 363-17.000.
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Kim, Bang M., 4,533,440, Cl. 204-1.00T.
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McNamara, Robert P.; Ennis, Gregory B.; Feiertag, Richard J.; and Bauer, Robert K., 4,533,948, Cl. 358-122.000.

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Patel, Balkrishna R., 4,533,890, Cl. 335-234.000.

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Steinbaugh, Gary, 4,533,965, Cl. 360-62.000.

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Gisselberg, Paul D., III. Can crusher. 4,532,861, Cl. 100-233.000.

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Norling, Thomas B.; Polkowski, Joseph H.; Poulsen, Jeffrey A.; and Robinson, Daniel E., 4,533,914, Cl. 340-825.790.

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Smith, Alan; and Bailey, Peter J., 4,533,632, Cl. 435-47.000.

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Gleichaut, Winfried; Gunther, Oswin; Hoffmann, Dietrich; and Funke, Rolf, to Mauser-Werke Oberndorf GmbH; and Karl Schmidt GmbH. Rotating band for projectiles. 4,532,868, Cl. 102-527.000.

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Godlewski, Edward S. Shaft and gear adjuster. 4,532,822, Cl. 74-397.000.

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Goldin, Abraham; and Rodau, Andrew G. Non-slip handle with coding means. 4,533,139, Cl. 273-73.00J.

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Good, Don: *See*—
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Comper, Louis F.; and Scheiderich, Robert F., 4,533,305, Cl. 425-43.000.

Gorczyca, Thomas B.: *See*—
Bolon, Donald A.; Gorczyca, Thomas B.; and Hallgren, John E., 4,533,504, Cl. 260-463.000.

Gordon, David R.: *See*—
Carpenter, Ralph F.; and Gordon, David R., 4,533,836, Cl. 307-11.000.

Gordon, Eric M.; and Ondetti, Miguel A., to E. R. Squibb & Sons, Inc. Antibacterial O-sulfated β-lactam hydroxamic acids. 4,533,660, Cl. 514-210.000.

Gordon, James R. Conveyor belt scraper. 4,533,036, Cl. 198-499.000.

Gordon, James S., to MKF Energy Conservation Company. Textile dryer heat recovery system. 4,532,721, Cl. 34-34.000.

Gorman, Charles R.: *See*—
Cherney, Leon; Gorman, Charles R.; Traynor, Sean G.; and Cardenas, Carlos G., 4,533,751, Cl. 564-408.000.

Gorton, Thomas S., Jr.: *See*—
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Kawamata, Masanobu; Ushimaru, Koichi; Goshi, Hiroyuki; and Miyasako, Hideichi, 4,533,552, Cl. 424-78.000.

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Goto, Kimihiko: *See*—
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Gotoda, Katsuhiko: *See*—
Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Tadanobu; and Aizawa, Tatsuo, 4,533,618, Cl. 430-126.000.

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Gould Inc.: *See*—
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Grabmaier, Josef; Falckenberg, Richard; and Foll, Helmut, to Siemens Aktiengesellschaft. Method and device for asymmetrically coating a tape-shaped carrier body with silicon for further processing into solar cells. 4,533,428, Cl. 156-608.000.

Grabovac, Bosko, to Consolidated Devices, Inc. Adjustable fulcrum for torque wrenches. 4,532,836, Cl. 81-483.000.

Grady, John K.; and Rice, Richard E., to Grady, John K. Masked scanning X-ray apparatus. 4,534,051, Cl. 378-099.000.

Graf, Lothar, to Ing. Erich Pfeiffer GmbH & Co. KG, Firma. Metering pump, as well as process and apparatus for filling a container equipped with a metering pump. 4,532,967, Cl. 141-3.000.

Granatstein, Victor L.: *See*—
Lau, Yue-Ying; Chu, Kwo R.; Granatstein, Victor L.; and Barnett, Larry R., 4,533,875, Cl. 330-4.000.

Grauberger, Hermann: *See*—
Heller, Albert; Birkmair, Hubert; and Grauberger, Hermann, 4,532,864, Cl. 101-219.000.

Grebur, Dennis J.: *See*—
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., 4,533,534, Cl. 523-436.000.
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Green, Jerome J., to Raytheon Company. Dielectric waveguide phase shifter. 4,532,704, Cl. 29-600.000.

Green, Sara. Electric hair curler with self-contained battery power supply. 4,533,818, Cl. 219-222.000.

Gregg, Hans, to Carl Hurth Maschinen-und Zahnradfabrik GmbH & Co. Method and apparatus for automatically supplying and removing pallets of a pallet magazine to and from the working space of a machine tool. 4,533,034, Cl. 198-472.000.

Greiler, Wolfgang: *See*—
Block, Werner; and Greiler, Wolfgang, 4,533,851, Cl. 313-51.000.

Grenier, Aime J.; and McBride, Lyle E., to Texas Instruments Incorporated. Magnetic circuit control apparatus. 4,533,888, Cl. 335-131.000.

Grey, Roger A., to Atlantic Richfield Company. Preparation of aldehydes from aryl acid halides and organozinc compounds with complex palladium catalysts. 4,533,754, Cl. 568-437.000.

Griggs, Colin G., to British Petroleum Company p.l.c., The. Process for the production of ethylene glycol. 4,533,774, Cl. 568-866.000.

Grims, Conrad M., to Adolph Coors Company. Deflectable pin assembly. 4,533,039, Cl. 198-651.000.

Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., to Scherer Laboratories, Inc. Method of forming stable dental gel of stannous fluoride. 4,533,544, Cl. 424-52.000.

Gronholz, Claus; and Schmidt-Rabenau, Hartmut, to Eppendorf Geratebau Netheler & Hinz GmbH. Process for mixing liquid samples to be analyzed, as well as apparatus for performing this process. 4,533,255, Cl. 366-108.000.

Grosser, Frank R.: *See*—
O'Connor, James M.; Scardera, Michael; and Grosser, Frank R., 4,533,485, Cl. 252-156.000.

Grossman, Bertrand M.: *See*—
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Gruner & Jahr Ag & Co.: *See*—
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GTE Automatic Electric Incorporated: *See*—
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GTE Communication Systems Corporation: *See*—
Koppensteiner, James V.; and Kaczkos, John E., 4,533,977, Cl. 361-415.000.

GTE Products Corporation: *See*—
Eby, John E.; and Kingston, Charles M., 4,533,944, Cl. 358-107.000.
French, Kenneth; Kocher, Robert C.; Piorkow, Alfred; Shaner, Kenneth; and Smith, J. Thomas, 4,533,251, Cl. 356-384.000.

Gucklhorn, Karl; and Carl, Wolfgang, to Alfing Kessler Sondermaschinen GmbH. Tool exchanging apparatus for a machine tool having a plurality of processing spindles. 4,532,693, Cl. 29-568.000.

Guedon born Saglier, Isabelle; Barritault, Denis; Courtois, Yves; Arruti, Cristina; and Prunieras, Michel, to Institut National de la Sante et de la Recherche Medicale. Process for stimulating the growth of epidermal cells. 4,533,635, Cl. 435-240.000.

Guigon, Jean-Paul, to Framatome & Cie. Device for supporting and rotating a part of large dimensions. 4,533,128, Cl. 269-58.000.

Gundlach, Robert W.: *See*—
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Gunnewig, Hubert, to Westfalia Separator AG. Self-emptying centrifuge drum. 4,533,344, Cl. 494-36.000.

Gunther, Oswin: *See*—
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Gupta, Tapan K.: *See*—
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Gust, Lawrence J.; O'Sullivan, Eileen F.; and Wood, Ronald C., Jr., to Mobil Oil Corporation. Low coefficient of friction film structure and method of forming the same. 4,533,509, Cl. 264-171.000.

Gustav, Jeske: *See*—
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Guzdar, Adi R., to Foster-Miller Associates, Inc. Sealing and liquid displacement systems for a linear pocket feeder. 4,533,289, Cl. 414-217.000.

Guzowski, Christopher B.: *See*—
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Gyarfas, Andras: *See*—
Gal, Jozsef; Gyarfas, Andras; Katko , Laszlo ; Racz, Gabor; Sarlos, Agoston; and Vozari, Gyula, 4,533,912, Cl. 340-783.000.

Gyulavari, Imre, to Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt. Apparatus for treating liquids. 4,533,470, Cl. 210-96.100.

Haag, James W., to Texaco Inc. Method for reducing air pollution. 4,533,374, Cl. 62-18.000.

Haarmann, Walter: *See*—
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Haarmann, Walter, 4,533,664, Cl. 514-225.000.

Hackauf, Klaus-Dieter, to Hans H. Meyer GmbH Maschinenbau. Forklift attachment with four laterally displaceable prongs. 4,533,290, Cl. 414-667.000.

Haden Schweitzer Corporation: *See*—
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Hadley, Michael S.: *See*—
Blaney, Francis E.; Hadley, Michael S.; King, Francis D.; and Watts, Eric A., 4,533,498, Cl. 260-243.300.

Hadzismajlovic, Dzemal. Gas scrubbing method using gas liquid contact in a particulate bed. 4,533,367, Cl. 55-91.000.

Hafstad, Bjorn. Lighting fixtures with beam support and opposite end contact means. 4,533,983, Cl. 362-223.000.

Hagemann, Hermann: *See*—
Baasner, Bernd; Hagemann, Hermann; and Klauke, Erich, 4,533,776, Cl. 568-946.000.

Hagemeyer, Kenneth L.; and Pearson, Vernon W., to Ex-Cell-O Corporation. Cutter head with locking pressure indicator. 4,533,287, Cl. 409-234.000.

Hager, Thomas A. Transmission for racing cars. 4,532,821, Cl. 74-370.000.

Hagiwara, Yoshimune: *See*—
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Haissig, Manfred: *See*—
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Hakuraku, Yoshinori; Ogata, Hisanao; Daikoku, Takahiro; and Suzuki, Noboru, to Hitachi, Ltd. Magnetic refrigerator. 4,532,770, Cl. 62-3.000.

Hall, Frances E. Sanitary napkin construction. 4,533,357, Cl. 609-401.000.

Hall, Ralph F.: *See*—
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Hallgren, John E.: *See*—
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Hallock, Donald W.; Hartmann, Thomas M.; and Engebretson, Marvin, to National Rivet & Manufacturing Company. Fastener setting tools. 4,533,075, Cl. 227-55.000.

Halpern, Alan A. Femoral head remodeling and prosthetic means therefor. 4,532,661, Cl. 623-23.000.

Hamada, Tooru, to Kabushiki Kaisha Daikin Seisakusho. Damper disc. 4,533,338, Cl. 464-64.000.

Hamada, Yoneichi: *See—*
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Hamilton, Noble E.: *See—*
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Hamilton, Robert: *See—*
Andrew, Wesley A.; Shields, Curtis E.; Hindlin, Harry O.; and Hamilton, Robert, 4,533,333, Cl. 441-38.000.

Hamilton, Robert W.: *See—*
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Hammann, Ingeborg: *See—*
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Hammond, Thomas J.; Lama, William L.; Northrup, Karl A.; and Corona, Stephen C., to Xerox Corporation. Mechanism and method for controlling the temperature and output of a fluorescent lamp. 4,533,853, Cl. 315-117.000.

Hams, Kenneth A., to Bell & Howell Company. Method and apparatus for preventing insertion errors. 4,533,133, Cl. 271-9.000.

Hanaoka, Yuzuru; Murayama, Takeshi; Muramoto, Setsuo; and Matsuura, Tamizo, to Kokogawa Hokushin Electric Corporation. Apparatus for analysis of anions. 4,533,518, Cl. 422-70.000.

Hance, Richard O.; and Hansen, Gerald M. Rapid fire attachment for semi-automatic firearms. 4,532,852, Cl. 89-136.000.

Handotal Kenkyu Shinkokai: *See—*
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Hansen, Gerald M.: *See—*
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Happ, Lawrence R.: *See—*
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Haque, Yusuf; and Ofner, Erwin, to American Microsystems, Inc. Differential operational amplifier with common mode feedback. 4,533,876, Cl. 330-253.000.

Harada, Kenichi: *See—*
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Harada, Toru: *See—*
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Harder, David. Truck having a front axle oscillatable relative to a rear axle. 4,533,010, Cl. 180-41.000.

Harder, John O.; McCandless, Doyle W.; and Peterson, Michael W., to John Harder & Co. Machine for removing electric traction motors from wheel spindles. 4,532,689, Cl. 29-426.500.

Hardy, Carl D. Curved-body maneuverable snow board. 4,533,150, Cl. 280-12.00H.

Harford, Eugene W.: *See—*
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Hargassner, Reinhard; Nugent, Thomas J.; Scheinecker, Alois; and Engel, Kurt, to Voest Alpine International Co. Continuous casting plant. 4,532,981, Cl. 164-483.000.

Harley-Davidson Motor Co., Inc.: *See—*
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Harmon, Larry R.; Reiche, John C.; Bowles, Howard R.; and Chiu, Norman H., to General Electric Company. Start circuit for microwave oven. 4,533,810, Cl. 219-10.55B.

Harradine, Brian D.: *See—*
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Harrill, Roy L.; and Odom, James T., to Avco Corporation. Priority circuit for a multiplexer terminal. 4,533,994, Cl. 364-200.000.

Harris, Eugene G., to National Distillers and Chemical Corporation. Process for the production of fragrance quality ethylene glycol monoaryl ethers. 4,533,759, Cl. 568-648.000.

Harris, George E., to RCA Corporation. Apparatus for thermoforming dome-shaped actuating elements for membrane switches. 4,533,555, Cl. 425-384.000.

Harshaw/Filtrol Partnership: *See—*
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Harshbarger, John H., to Visual Information Institute, Inc. Method of testing the linearity of a raster scan. 4,533,950, Cl. 358-139.000.

Hart, Derrick A.: *See—*
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Hart Group, The: *See—*
Hower, Larry H., 4,534,058, Cl. 381-67.000.

Hartman, Clyde H. Two-piece drill chuck wrench. 4,532,834, Cl. 81-16.000.

Hartmann, Achim, to Kronos Titan, GmbH. Process for the separation of volatile chlorine compounds from the exhaust gases resulting from the chlorination of titanium-containing raw materials. 4,533,530, Cl. 423-240.000.

Hartmann, Thomas M.: *See—*
Hallock, Donald W.; Hartmann, Thomas M.; and Engebretson, Marvin, 4,533,075, Cl. 227-55.000.

Hartshorn, Kevin; and McGahan, Wallace A., to Ingersoll-Rand Company. Valving element for a plate-type valve. 4,532,959, Cl. 137-516.130.

Hartung, Michael H.; and Nolan, Kenneth P., to International Business Machines Corporation. Peripheral systems accommodation of guest operating systems. 4,533,996, Cl. 364-200.000.

Hartung, Michael H.: *See—*
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; and William, John S., 4,533,995, Cl. 364-200.000.

Hase, Nobuyasu: *See—*
Ogura, Mototsugu; Ban, Yuzaburoh; and Hase, Nobuyasu, 4,533,410, Cl. 148-175.000.

Hasegawa, Masayuki, to Nihon Almit Kabushiki Kaisha. Soldering fluxes. 4,533,404, Cl. 148-23.000.

Hasegawa, Ryusuke, to Allied Corporation. Iron-boron solid solution alloys having high saturation magnetization and low magnetostriction. 4,532,979, Cl. 164-463.000.

Hasegawa, Tetsuo: *See—*
Ohsaki, Ichiro; Hasegawa, Tetsuo; and Suematsu, Koushi, 4,533,616, Cl. 430-110.000.

Hashido, Kenkichi: *See—*
Maehara, Naoyoshi; Hashido, Kenkichi; and Hirata, Hiroshi, 4,533,082, Cl. 239-102.000.

Hashimoto, Hiroshi: *See—*
Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, 4,533,547, Cl. 424-122.000.

Hashimoto, Kametaro; Ushitani, Kenji; Noda, Fumiyoshi; Sugiyama, Masahiko; and Murachi, Mikio, to Toyoda Jidosha Kogyo Kabushiki Kaisha. Vibration-resistant, heat-insulating casting and method of making. 4,533,579, Cl. 428-36.000.

Hashimoto, Seiichi, to Kabushiki Kaisha Taiyo Hatsujyo Seisakusho. Double clip for office use. 4,532,680, Cl. 24-67.00R.

Hasumi, Ryoichi: *See—*
Tanaka, Yoshio; Nishikawa, Yasuhisa; Hasumi, Ryoichi; and Koizumi, Takashi, 4,532,818, Cl. 74-10.330.

Hattori, Kyo: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,533,847, Cl. 310-181.000.

Hattori, Nobutaka: *See—*
Sato, Akihiro; Kikuta, Kazutsune; Uwai, Toshihiro; Matsuda, Kenji; and Hattori, Nobutaka, 4,533,705, Cl. 526-114.000.

Hattori, Shigeru: *See—*
Tsunoda, Kazuhiko; and Hattori, Shigeru, 4,533,153, Cl. 280-277.000.

Haugwitz, Werner, to SKF Kugellagerfabriken GmbH. Housing for roller bearings with lubricating means. 4,533,264, Cl. 384-472.000.

Hauser, Wolfgang: *See—*
Vejmelka, Peter; Kluger, Wolfgang; Koster, Rainer; and Hauser, Wolfgang, 4,533,395, Cl. 106-89.000.

Hawkins, Joel W. Wheeled stand. 4,533,127, Cl. 269-17.000.

Hawkins, Patricia A.: *See—*
Jones, Corey N.; and Hawkins, Patricia A., 4,533,329, Cl. 434-219.000.

Hayakawa, Kizo; Mori, Nobuyuki; Watanabe, Yoshio; and Nakashima, Kazumi, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Fuel injection type internal combustion engine. 4,532,898, Cl. 123-276.000.

Hayashi, Ikuo: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,533,847, Cl. 310-181.000.

Hayes, Lawrence S. Luminous gun sighting system. 4,533,980, Cl. 362-110.000.

Hayman, Gary D. Safe apparatus. 4,532,870, Cl. 109-58.000.

Hayssen Manufacturing Company: *See—*
Kovacs, Lloyd, 4,532,753, Cl. 53-451.000.

Hayter, Anthony J.: *See—*
Eakin, Murdoch A.; Hayter, Anthony J.; and Furr, Barrington J. A., 4,533,672, Cl. 514-415.000.

Health Care Concepts, Inc.: *See—*
Meierhoefer, Eugene J., 4,533,068, Cl. 222-189.000.

HealthScan Inc.: *See—*
Sonne, Leonard J., 4,533,137, Cl. 272-99.000.

Healy, Thomas D.: *See—*
Martens, George D.; Smith, Alexander B.; and Healy, Thomas D., 4,532,796, Cl. 73-632.000.

Heath, Chester A.: *See*—
Andrews, Lawrence P.; Heath, Chester A.; Mead, Justin E.; VanDuren, Richard G.; and Janes, Gary A., 4,534,011, Cl. 364-900.000.
Heathcock, Osmond R.: *See*—
Atherton, John R.; Sindall, John H.; and Heathcock, Osmond R., 4,532,997, Cl. 169-56.000.
Heberlein, Irmtrud: *See*—
Michel, Wolfgang; Paul, Heinz; Rummel, Andreas; Seher, Gero; Ossowski, Manfred; and Heberlein, Irmtrud, 4,533,438, Cl. 201-31.000.
Hebert, John R., Jr., to Sprague Electric Company. Transformerless power inverter with only one type transistors. 4,533,989, Cl. 363-132.000.
Hecker, Joel: *See*—
DiMatteo. Paul; and Hecker, Joel, 4,533,828, Cl. 250-216.000.
Heeres, Jan; and Mostmans, Joseph H., to Janssen Pharmaceutica, N.V. Heterocyclic derivatives of (4-aryloxymethyl-1,3-dioxolan-2-yl)methyl-1H-imidazoles and 1H-1,2,4-triazoles. 4,533,550, Cl. 514-256.000.
Hegner, Gunter: *See*—
Forberg, Horst; Achtnig, Klaus-Peter; Hegner, Gunter; and Boes, Gerhard, 4,533,196, Cl. 339-97.00P.
Heidemeyer, Paulus; and Zantopp, Werner, to Volkswagenwerk Aktiengesellschaft. Hybrid drive for a vehicle, in particular an automobile. 4,533,011, Cl. 180-65.200.
Heilmeler & Weinlein Fabrik Fuer Oel-Hadraulik GmbH & Co., KG: *See*—
Brunner, Rudolf, 4,532,960, Cl. 137-596.130.
Hein, Klaus R. G.: *See*—
Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, 4,533,532, Cl. 423-244.000.
Heitmann, Jurgen, to Robert Bosch GmbH. Method and apparatus for scrambled pulse-code modulation transmission or recording. 4,534,037, Cl. 375-25.000.
Heller, Albert; Birkmair, Hubert; and Grauberger, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Printing machine web turning bar adjustment mechanism. 4,532,864, Cl. 101-219.000.
Helmes, Ludger: *See*—
Komesker, Heinrich; and Helmes, Ludger, 4,532,667, Cl. 15-49.00C.
HemoTec, Inc.: *See*—
Baugh, Robert F.; Braun, Walter J.; and Cooper, Daniel, 4,533,519, Cl. 422-73.000.
Henderson, Harry E.; and Smith, Clinton R., to Imperial Oil Limited. Traction fluid lubricants derived from mineral oil. 4,533,778, Cl. 585-13.000.
Hendriks, Rudolf, to Thomassen International. Method of improving the part-load behavior of a turbo machine, and a compressor or pump adapted for use of such method. 4,533,293, Cl. 415-117.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Kluth, Hermann; Roderhoff, Bernhard; Friedemann, Wolfgang; Wegner, Jurgen; and Dierichs, Wolfgang, 4,533,490, Cl. 252-305.000.
Henshall, John B.: *See*—
Clark, Malcolm C.; Henshall, John B.; and Hart, Derrick A., 4,533,499, Cl. 260-391.000.
Herberling, Paul V., to General Electric Company. Method for reducing nitric oxide emissions from a gaseous fuel combustor. 4,533,314, Cl. 431-4.000.
Herbst, Walter B., to American Hospital Supply Corporation. Food tray and lid with sealed panels and method of forming same. 4,533,061, Cl. 220-4.00B.
Herchenbach, Horst; and Ramesohl, Hubert, to Klockner-Humboldt-Deutz AG. Method for the thermal treatment of mineral raw materials. 4,533,396, Cl. 106-100.000.
Herget, Werner, to Siemens Aktiengesellschaft. Method of transmitting serial data between facsimile equipment and interface performing the same. 4,533,958, Cl. 358-280.000.
Hermann, Hans D.; Fabian, Klaus; and Ebigt, Joachim, to Hoechst Aktiengesellschaft. Polyvinylbutyral films which contain plasticizer and have a reduced adhesive power on glass. 4,533,601, Cl. 428-437.000.
Hershey, Harold J.: *See*—
Baumhauer, John C., Jr.; Hershey, Harold J.; and Poteat, Tommy L., 4,533,795, Cl. 179-111.00E.
Hershfeld, Robert R., to Baltimore Spice Company, The. Apparatus for shower applying liquid smoke. 4,532,858, Cl. 99-534.000.
Herve Et Fils, S.A.: *See*—
Bavoux, Guy; and Dallaserra, Arthur B., 4,532,863, Cl. 101-153.000.
Hewitt, Lawrence B.: *See*—
Cornish, William D.; and Hewitt, Lawrence B., 4,533,886, Cl. 333-218.000.
Hewlett-Packard Company: *See*—
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., 4,532,970, Cl. 141-98.000.
Hexcel Corporation: *See*—
Lee, Frank W. C.; and Baron, Kenneth S., 4,533,715, Cl. 528-45.000.
Hibbel, Josef: *See*—
Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, 4,533,755, Cl. 568-454.000.
Hibino, Yoshitaka; and Ozaki, Syunzaburo, to Honda Giken Kogyo Kabushiki Kaisha. Deceleration control apparatus for a multi-cylinder internal combustion engine. 4,532,900, Cl. 123-327.000.
Hickman, Alvin E., to Beal, Walter. Sucker rod scraper method and device. 4,532,988, Cl. 166-176.000.
Higgins, Robert J., Jr., to Motorola, Inc. Apparatus for suppression of spurious attenuation poles in crystal filters. 4,533,885, Cl. 333-191.000.
Hightower, James H. Motorized golf cart. 4,533,013, Cl. 180-210.000.
Hill, James B.: *See*—
Borneman, Paul R.; and Hill, James B., 4,533,391, Cl. 75-128.00A.
Hill, Kevin E., to Milsco Manufacturing Company. Resiliently suspended, tiltable and tethered vehicle operator's seat having fore and aft adjustment. 4,533,110, Cl. 248-573.000.
Hilti Aktiengesellschaft: *See*—
Jochum, Peter, 4,533,077, Cl. 227-156.000.
Hindlin, Harry O.: *See*—
Andrew, Wesley A.; Shields, Curtis E.; Hindlin, Harry O.; and Hamilton, Robert, 4,533,333, Cl. 441-38.000.
Hirai, Tetsuo: *See*—
Sugihara, Masahiro; Morishita, Etsuo; Hirai, Tetsuo; and Sekiya, Shin, 4,533,292, Cl. 415-2.00R.
Hirano, Atsushi: *See*—
Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, 4,533,547, Cl. 424-122.000.
Hirano, Hiroyuki: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,533,340, Cl. 474-28.000.
Hirata, Hiroshi: *See*—
Maehara, Naoyoshi; Hashido, Kenkichi; and Hirata, Hiroshi, 4,533,082, Cl. 239-102.000.
Hirata, Yasushi: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,533,711, Cl. 526-340.400.
Hirayama, Yoshiyuki: *See*—
Watai, Yuji; Yasui, Hirokazu; Hirayama, Yoshiyuki; and Matsuura, Akira, 4,533,234, Cl. 355-14.00D.
Hirose, Takao: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Katoh, Osamu, 4,533,535, Cl. 423-447.400.
Hirose, Takeshi: *See*—
Ichijima, Seiji; and Hirose, Takeshi, 4,533,625, Cl. 430-552.000.
Miyawaki, Yoshiharu; Hirose, Takeshi; Hamada, Yoneichi; Mizuoka, Seishi; and Tsuru, Masahiro, 4,532,980, Cl. 164-475.000.
Hirschauer, Andre : *See*—
Chauvin, Yves; Commereuc, Dominique; Hirschauer, Andre ; Reffet, Dominique; and Stern, Robert, 4,533,500, Cl. 260-404.000.
Hirschbuehler, Kevin; and Susman, Samuel E., to American Cyanamid Co. Curable epoxy resin compositions. 4,533,686, Cl. 523-468.000.
Hisajima, Masahiko: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Yamamoto, Kiyonori; Watashi, Masahiro; Yoshinaga, Shinsuke; and Yamamoto, Toshihiko, 4,533,233, Cl. 355-8.000.
Hisatake, Yoshihiko: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.
Hitachi Denshi Kabushiki Kaisha: *See*—
Kobayashi, Masahito; Maeda, Narimichi; Hagiwara, Yoshimune; Akazawa, Takashi; and Sugiyama, Shizuo, 4,534,010, Cl. 364-748.000.
Hitachi Engineering Co., Ltd.: *See*—
Yamamoto, Michiyoshi; Ohsumi, Katsumi; Mitani, Shinji; Takashima, Yoshie; and Igarashi, Hiroo, 4,533,514, Cl. 376-308.000.
Hitachi, Ltd.: *See*—
Hakuraku, Yoshinori; Ogata, Hisanao; Daikoku, Takahiro; and Suzuki, Noboru, 4,532,770, Cl. 62-3.000.
Itoh, Haruo; Tokiguchi, Katsumi; Warabisako, Terunori; Saitoh, Tadashi; and Tokuyama, Takashi, 4,533,831, Cl. 250-492.200.
Kobayashi, Masahito; Maeda, Narimichi; Hagiwara, Yoshimune; Akazawa, Takashi; and Sugiyama, Shizuo, 4,534,010, Cl. 364-748.000.
Masuhara, Hideki; Katada, Kunio; and Kudo, Uichi, 4,533,892, Cl. 336-147.000.
Osawa, Tadao; Nakagawa, Toru; Okumura, Masamitsu; Kohno, Takashige; and Sakuma, Tokihiko, 4,532,904, Cl. 123-439.000.
Shibata, Akira; Wada, Isao; and Yoshioka, Atsushi, 4,533,961, Cl. 358-315.000.
Yamamoto, Michiyoshi; Ohsumi, Katsumi; Mitani, Shinji; Takashima, Yoshie; and Igarashi, Hiroo, 4,533,514, Cl. 376-308.000.
Hitachi Zosen Corporation: *See*—
Shiraishi, Minoru; Numata, Yoshimi; Tano, Hiroshi; and Onaka, Tatsumi, 4,532,878, Cl. 114-222.000.
Hitchiner Manufacturing Co., Inc.: *See*—
Chandley, George D., 4,532,976, Cl. 164-363.000.
Ho, Phillman N., to Union Oil Company of California. Oil shale extraction process. 4,533,460, Cl. 208-11.0LE.
Hoag, Ethan D., to Metalworking Lasers International Ltd. Apparatus for establishing and maintaining a stable electrical discharge across a stream of gas, and a high-power laser including such apparatus. 4,534,032, Cl. 372-34.000.
Hoagland, Frank V. N.; and Aquino, Agostino J., to Nabisco Brands, Inc. Labeling machine. 4,533,426, Cl. 156-492.000.

Hoechst Aktiengesellschaft: *See—*
Back, Gunter, 4,533,239, Cl. 355-72.000.
Cargnino, Francesco; Natoli, Giuseppe; and Lorke, Horst, 4,533,479, Cl. 252-34.000.
Hermann, Hans D.; Fabian, Klaus; and Ebigt, Joachim, 4,533,601, Cl. 428-437.000.
Winkelmann, Detlef; and Padberg, Peter, 4,533,611, Cl. 430-49.000.

Hoekstra, George R.; and Forgac, John M., to Standard Oil Company (Indiana). Pulsed retorting with continuous shale oil upgrading. 4,532,991, Cl. 166-261.000.

Hoenle, Walter A.; Perkins, David J.; and Schenten, James L., to Chrysler Corporation. Rear offset axle suspension system for vehicle. 4,533,157, Cl. 280-718.000.

Hofferber, James A., to Phillips Petroleum Company. Control of a polymerization reaction. 4,533,517, Cl. 422-62.000.

Hoffman, Kenneth P.: *See—*
Corsover, William L.; Hoffman, Kenneth P.; McCann, William F.; and Wooden, Billy J., 4,533,278, Cl. 404-65.000.

Hoffman, Richard A., to Westinghouse Electric Corp. Article such as jewelry or a wristwatch component having composite multi-film protective coating. 4,533,605, Cl. 428-635.000.

Hoffmann, Dietrich: *See—*
Gleichaut, Winfried; Gunther, Oswin; Hoffmann, Dietrich; and Funke, Rolf, 4;532,868, Cl. 102-527.000.

Hoffmann, Gerhard: *See—*
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, 4,533,612, Cl. 430-59.000.

Hofmann, Rudolf. Air cooler with condensate trap. 4,532,775, Cl. 62-272.000.

Hogan, Philip J.: *See—*
Dewing, John; Hogan, Philip J.; and Stewart, Allan, 4,533,533, Cl. 423-328.000.

Hohla, Kristian; and Albers, Ernst, to Lambda Physik GmbH. Discharge-pumped laser. 4,534,034, Cl. 372-59.000.

Hokanson, D. Eugene. Focusing mechanism for an ultrasound device. 4,532,933, Cl. 128-660.000.

Hokanson, Ronald A., to Formers of Houston, Inc. Tube former apparatus. 4,532,754, Cl. 53-451.000.

Holden, M. James, to Mobil Oil Corporation. Liquid holding packaging tray. 4,533,585, Cl. 428-116.000.

Holdren, Carl F.: *See—*
Bonini, Bruno; Cook, Raymond G.; Holdren, Carl F.; and Johnston, Everett A., 4,533,098, Cl. 244-110.00B.

Holdridge, Robert B.: *See—*
Taff, Douglas C.; and Holdridge, Robert B., 4,532,917, Cl. 126-430.000.

Holland, Gerhard; and Nowak, Rudolf, to Holland, Gerhard. Chemical process for producing alkali and alkaline earth metals. 4,533,387, Cl. 75-66.000.

Hollander, Frans: *See—*
Bruinsma, Hans; Hollander, Frans; Huisman, Rein L.; and Reinen, Adrianus G., 4,532,789, Cl. 72-202.000.

Holmes, Robert G.; and Shearer, Scott A., to Ohio Agricultural Research & Development Center. Seed planter, planter assembly and method of picking up and discharging single seeds. 4,533,066, Cl. 221-211.000.

Holstedt, Richard A.; and Jessup, Peter J., to Union Oil Company of California. Bis(hydrocarbyloxy methylated) boron-containing, heterocyclic compounds and lubricating compositions containing the same. 4,533,480, Cl. 252-46.400.

Holt, John K., to Harbor Branch Foundation, Inc. Automatic chemical analysis methods. 4,533,641, Cl. 436-43.000.

Holtman, Richard K.: *See—*
Betzner, William E.; and Holtman, Richard K., 4,533,436, Cl. 162-261.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hibino, Yoshitaka; and Ozaki, Syunzaburo, 4,532,900, Cl. 123-327.000.
Itoh, Kazuhiro; Sugisaki, Mutsuo; and Tanaka, Hiroshi, 4,532,685, Cl. 29-156.40R.
Tsunoda, Kazuhiko; and Hattori, Shigeru, 4,533,153, Cl. 280-277.000.

Honda, Kazuhiro; and Kuramochi, Hiroshi, to Kokoku Rubber Industrial Company Limited. Pressure-sensitive and conductive rubber. 4,533,604, Cl. 428-521.000.

Honda, Tsuguo: *See—*
Kuroki, Hironori; Honda, Tsuguo; and Mitsui, Toshihisa, 4,532,978, Cl. 164-448.000.

Honeywell, Inc.: *See—*
Baumann, Rainer, 4,533,248, Cl. 356-350.000.
Boord, Warren T.; and Fryer, Richard B., 4,533,872, Cl. 324-252.000.
Callaghan, Timothy J.; and Kay, Robert M., 4,533,250, Cl. 356-350.000.
Johnson, Robert G., 4,533,167, Cl. 294-86.400.
Kolbas, Robert M., 4,532,694, Cl. 29-569.00L.
Nelson, Lorne W., 4,533,315, Cl. 431-20.000.
Webber, George E., 4,533,249, Cl. 356-350.000.

Honeywell Information Systems Inc.: *See—*
Funke, Michael J.; Topliffe, Douglas A.; and Rathbun, Donald J., 4,534,044, Cl. 375-120.000.

Hongo, Toshio, to Maru Kikai Kogyo Co., Ltd. Apparatus for adjusting to tool length of panel forming machine. 4,532,792, Cl. 72-319.000.

Hoppel, Rainer, to Robert Bosch GmbH. Fuel supply system. 4,532,906, Cl. 123-470.000.

Horie, Seiji: *See—*
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,533,613, Cl. 430-78.000.

Horn, Edward R., to Aladdin Engineering. Retaining ring assembly machine. 4,532,706, Cl. 29-809.000.

Horwitz, Benjamin: *See—*
Cahen, David; Malkin, Shmuel; Horwitz, Benjamin; and Bults, Gerard, 4,533,252, Cl. 356-432.000.

Hoshino, Ryoichi: *See—*
Momose, Yutaka; Yamaguchi, Kazuaki; Okamoto, Masayoshi; Hoshino, Ryoichi; and Tanaka, Hiroki, 4,532,771, Cl. 62-6.000.

Hoshino, Takahiro, to Toyo Bussan Kabushiki Kaisha. Cold-proof water-proof garment. 4,533,335, Cl. 441-102.000.

Howa Kogyo Kabushiki Kaisha: *See—*
Miyachi, Chihiro, 4,532,692, Cl. 29-568.000.

Howells, Richard D. Fluoroaliphaticsulfonamides containing oxirane groups and/or N-β-hydroxyalkylene groups. 4,533,713, Cl. 528-26.000.

Hower, Larry H., to Hart Group, The. Electronic stethoscope with automatic power shut-off. 4,534,058, Cl. 381-67.000.

Howerton, Anderson W., to Dayco Corporation. Belt construction and method of making the same. 4,533,040, Cl. 198-847.000.

Hudgin, Donald E.; and Semsarzadeh, Mohammad A. Polymer-metal blend. 4,533,685, Cl. 523-457.000.

Hudson Engineering Company: *See—*
Napolitano, Pellegrino E., 4,532,958, Cl. 137-454.200.

Hudspeth, Thomas; and Keeling, Harmon H., to Hughes Aircraft Company. Coaxial transmission line crossing. 4,533,883, Cl. 333-1.000.

Hudspeth, Thomas; and Keeling, Harmon H., to Hughes Aircraft Company. Coaxial line to waveguide adapter. 4,533,884, Cl. 333-26.000.

Huffman, Ronald E., to KV33 Corporation. Mounting for dental model articulators. 4,533,323, Cl. 433-60.000.

Hughes Aircraft Company: *See—*
Hudspeth, Thomas; and Keeling, Harmon H., 4,533,883, Cl. 333-1.000.
Hudspeth, Thomas; and Keeling, Harmon H., 4,533,884, Cl. 333-26.000.
Williams, Frederick C., 4,533,916, Cl. 343-7.400.

Hughes, Gregory: *See—*
Deschenaux, Warren; Hughes, Gregory; Kreuzer, Justin; and La Fiandra, Carlo, 4,534,047, Cl. 378-35.000.

Huhn, Karl: *See—*
Preiner, Gerhard; Huhn, Karl; Muller, Johann; Marwitz, Heinrich; and Ullrich, Kurt, 4,533,477, Cl. 252-8.900.

Huisman, Rein L.: *See—*
Bruinsma, Hans; Hollander, Frans; Huisman, Rein L.; and Reinen, Adrianus G., 4,532,789, Cl. 72-202.000.

Hung, Le K.: *See—*
Mitkov, Atanas L.; Georgiev, Ivan N.; Radulov, Peter T.; Hung, Le K.; and Atanassov, Atanas K., 4,532,940, Cl. 130-6.000.

Hurst, Robert N., to RCA Corporation. Color modifier for composite video signals. 4,533,938, Cl. 358-27.000.

Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. High thermal conductivity aluminum nitride ceramic body. 4,533,645, Cl. 501-96.000.

Hutchison, Alan J., to Pfizer Inc. Imidazolidinedione derivatives. 4,533,667, Cl. 514-278.000.

Huxtable, Douglas D.: *See—*
Clark, Edward C.; and Huxtable, Douglas D., 4,532,778, Cl. 62-477.000.

Hwang, Wei: *See—*
Fang, Frank F.; Grossman, Bertrand M.; and Hwang, Wei, 4,532,698, Cl. 29-571.000.

Hyodo, Motoi: *See—*
Okazaki, Hiroshi; and Hyodo, Motoi, 4,533,107, Cl. 248-430.000.

Hyytinen, Timo, to Valmet Oy. Butt plate construction of a firearm and in particular that of a shotgun. 4,532,730, Cl. 42-73.000.

Ibuki, Tadayuki; Sugihara, Taisuke; Kawakubo, Hiromu; and Sone, Takanori, to Asahi Kasei Kogyo Kabushiki Kaisha. Aminoindazole derivatives. 4,533,731, Cl. 544-140.000.

Ichijima, Seiji; and Hirose, Takeshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive materials. 4,533,625, Cl. 430-552.000.

Ichikawa, Izuo: *See—*
Ikegami, Yoshihiko; Kurihara, Kozo; Ichikawa, Izuo; and Nakane, Hisanori, 4,533,562, Cl. 427-3.000.

Ichikawa, Tomoyuki: *See—*
Lederis, Karl P.; MacCannell, Keith L.; and Ichikawa, Tomoyuki, 4,533,654, Cl. 514-12.000.

Ichikoh Industries Limited: *See—*
Saito, Kunihiro, 4,533,860, Cl. 313-673.000.

Ichimura, Toshiaki: *See—*
Taniguchi, Isoji; Kimura, Yoshiharu; and Ichimura, Toshiaki, 4,533,712, Cl. 528-9.000.

Ideal Industries, Inc.: *See—*
Scott, William J., 4,532,679, Cl. 24-16.0PB.

Idemitsu Kosan Company Limited: *See—*
Taniguchi, Isoji; Kimura, Yoshiharu; and Ichimura, Toshiaki, 4,533,712, Cl. 528-9.000.

Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippon Soken, Inc. Rotary drive apparatus with permanent magnets on the rotor and stator. 4,533,847, Cl. 310-181.000.

Igarashi, Hiroo: *See*—
Yamamoto, Michiyoshi; Ohsumi, Katsumi; Mitani, Shinji; Takashima, Yoshie; and Igarashi, Hiroo, 4,533,514, Cl. 376-308.000.

Igarashi, Seiko: *See*—
Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, 4,533,461, Cl. 208-44.000.

Iinuma, Kazumoto, to NEC Corporation. Method of processing picture signal to increase average run length and apparatus therefor. 4,533,957, Cl. 358-261.000.

Iinuma, Kazumoto, to Nippon Electric Co., Ltd. Code conversion system. 4,534,055, Cl. 381-34.000.

Ikarus Karosszeria es Jarmugyar: *See*—
Gal, Jozsef; Gyarfas, Andras; Katko , Laszlo ; Racz, Gabor; Sarlos, Agoston; and Vozari, Gyula, 4,533,912, Cl. 340-783.000.

Ikeda, Kensuke; and Nakamura, Sukenori, to Fuji Photo Film Co., Ltd. Heat-sensitive recording sheet. 4,533,929, Cl. 346-209.000.

Ikeda, Takenori: *See*—
Okoshi, Noboru; and Ikeda, Takenori, 4,533,716, Cl. 528-73.000.

Ikegami, Yoshihiko; Kurihara, Kozo; Ichikawa, Izuo; and Nakane, Hisanori, to Sankyo Company, Limited. Method of preparing coated solid preparations. 4,533,562, Cl. 427-3.000.

Ikeuchi, Satoru; Inaba, Yoshihiro; Shimazaki, Hiroshi; and Kobayashi, Tatsuhiko, to Konishiroku Photo Industry Co., Ltd. Photographic element with imadazole dye mordant. 4,533,621, Cl. 430-213.000.

Ikezaki, Katsuji; and Ishii, Kiyoshi, to Sharp Kabushiki Kaisha. Electric cleaner with minimum noise. 4,533,370, Cl. 55-276.000.

Illinois Tool Works Inc.: *See*—
Rayburn, Charles C.; Padgitt, Howard R.; and Flair, Henry J., 4,533,813, Cl. 219-121.0LH.
Sygnator, Henry A., 4,532,663, Cl. 10-10.00R.

Imai, Hiroshuke: *See*—
Matsuno, Mitsuo; Kudoh, Michio; and Imai, Hiroshuke, 4,533,781, Cl. 585-516.000.

IMI Kynoch Limited: *See*—
Atherton, John R.; Sindall, John H.; and Heathcock, Osmond R., 4,532,997, Cl. 169-56.000.

Imperial Chemical Industries, PLC: *See*—
Dewing, John; Hogan, Philip J.; and Stewart, Allan, 4,533,533, Cl. 423-328.000.
Eakin, Murdoch A.; Hayter, Anthony J.; and Furr, Barrington J. A., 4,533,672, Cl. 514-415.000.
McKenzie, Ian D., 4,533,707, Cl. 526-125.000.
Walker, Edward R. H., 4,533,656, Cl. 514-19.000.

Imperial Oil Limited: *See*—
Henderson, Harry E.; and Smith, Clinton R., 4,533,778, Cl. 585-13.000.

Imran, Mir: *See*—
Kinney, Philip C.; Imran, Mir; and Donnelly, Edward J., 4,532,710, Cl. 33-141.00E.

Ina, Tatsuo. Device in universal head for tilting camera to the left and right. 4,533,103, Cl. 248-179.000.

Ina, Toshikazu: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; and Tokoro, Setsuo, 4,532,798, Cl. 73-116.000.

Inaba, Yoshihiro: *See*—
Ikeuchi, Satoru; Inaba, Yoshihiro; Shimazaki, Hiroshi; and Kobayashi, Tatsuhiko, 4,533,621, Cl. 430-213.000.

Inagaki, Masanari: *See*—
Nagata, Osamu; Inagaki, Masanari; and Yamada, Hajime, 4,532,877, Cl. 114-144.00E.

Inamori, Mikio: *See*—
Eguchi, Yasukata; and Inamori, Mikio, 4,532,874, Cl. 112-235.000.

Inamoto, Yoshiaki: *See*—
Takaishi, Naotake; Takahashi, Hitoshi; and Inamoto, Yoshiaki, 4,533,770, Cl. 568-817.000.

Incom, Inc.: *See*—
Jeskey, Richard V., 4,533,210, Cl. 350-96.300.

Ing. Erich Pfeiffer GmbH & Co. KG, Firma: *See*—
Graf, Lothar, 4,532,967, Cl. 141-3.000.

Ing. Luigi Conti Vecchi S.p.A.: *See*—
Cozza, Giorgio; and Piccolo, Luigi, 4,533,360, Cl. 23-298.000.

Ingersoll-Rand Company: *See*—
Hartshorn, Kevin; and McGahan, Wallace A., 4,532,959, Cl. 137-516.130.

Iniotakis, Nicolaos; and von der Decken, Claus-Benedict, to Kernforschungsanlage Julich GmbH. Process and arrangement for the incremental enrichment of deuterium and/or tritium in a material suitable for the isotope exchange of deuterium and/or tritium with hydrogen. 4,533,539, Cl. 423-648.00A.

Innocente Riganti Officine Meccaniche S.p.A.: *See*—
Riganti, Innocente, 4,533,785, Cl. 174-42.000.

Inoue, Hiroshige; Fukushima, Kenichi; and Nishiguchi, Ikuzo, to Yamamoto Chemical Industrial Company, Limited; and Osaka Municipal Government. 3-Propionylsalicylic acid derivatives and process for the preparation of the same. 4,533,732, Cl. 544-172.000.

Inoue, Kanji: *See*—
Ohno, Akira; Koyama, Hiroshi; Inoue, Kanji; and Ozawa, Hiroaki, 4,533,402, Cl. 148-12.400.

Inoue, Sukejiro; Fukumoto, Hiroshi; Sasakawa, Masumi; and Doi, Shinji, to Canon Kabushiki Kaisha. Heat fixing developer of capsule structure. 4,533,617, Cl. 430-111.000.

Inoue, Sukejiro: *See*—
Fukumoto, Hiroshi; Inoue, Sukejiro; Sasakawa, Masumi; and Doi, Shinji, 4,533,614, Cl. 430-99.000.

Inoue, Yoshikazu: *See*—
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,533,738, Cl. 548-194.000.

Institut Francais du Petrole: *See*—
Arnaudeau, Marcel, 4,533,474, Cl. 210-787.000.
Billon, Alain; Peries, Jean-Pierre; and Quignard, Alain, 4,533,462, Cl. 208-88.000.
Chauvin, Yves; Commereuc, Dominique; Hirschauer, Andre ; Reffet, Dominique; and Stern, Robert, 4,533,500, Cl. 260-404.000.
Courty, Philippe; Roussel, Michel; Leporq, Serge; Le Page, Jean-Francois; and Varin, Philippe, 4,533,650, Cl. 502-84.000.
Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, 4,533,526, Cl. 423-1.000.
Rojey, Alexandre; Bonifay, Regis; and Cariou, Jean-Paul, 4,532,773, Cl. 62-101.000.

Institut National de la Sante et de la Recherche Medicale: *See*—
Guedon born Saglier, Isabelle; Barritault, Denis; Courtois, Yves; Arruti, Cristina; and Prunieras, Michel, 4,533,635, Cl. 435-240.000.

Institut Problem Litiya Akademii Nauk Ukrainskoi SSR: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., 4,533,243, Cl. 356-44.000.

International Business Machines Corporation: *See*—
Andrews, Lawrence P.; Heath, Chester A.; Mead, Justin E.; Van-Duren, Richard G.; and Janes, Gary A., 4,534,011, Cl. 364-900.000.
Bjorklund, Gary C.; and Sincerbox, Glenn T., 4,533,211, Cl. 350-162.120.
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; and William, John S., 4,533,995, Cl. 364-200.000.
DePalma, Vincent M.; and Ward, Albert W., 4,533,582, Cl. 428-64.000.
Engwall, Mats A.; and Mulvany, Richard B., 4,533,186, Cl. 308-5.00R.
Fang, Frank F.; Grossman, Bertrand M.; and Hwang, Wei, 4,532,698, Cl. 29-571.000.
Gheewala, Tushar R.; and Kaplan, Steven B., 4,533,840, Cl. 307-306.000.
Goff, Willie, Jr.; and Rakes, James M., 4,533,921, Cl. 346-1.100.
Hartung, Michael H.; and Nolan, Kenneth P., 4,533,996, Cl. 364-200.000.
Kinney, Wayne I.; Lasky, Jerome B.; and Nesbit, Larry A., 4,532,700, Cl. 29-576.00W.
Paez, Ricardo; and Rodriguez, Jorge R., 4,534,030, Cl. 371-25.000.
Singh, Shanker; and Singh, Vijendra P., 4,534,029, Cl. 371-10.000.
Thomas, David R.; and Tien, Paul C., 4,534,017, Cl. 365-149.000.
Yeack-Scranton, Celia E.; and Vogel, Siegfried F., 4,532,802, Cl. 73-432.00R.

International Flavors & Fragrances, Inc.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,533,491, Cl. 252-522.00R.
Tokarzewski, Richard J.; and Schreiber, William L., 4,533,492, Cl. 252-522.00R.
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,533,746, Cl. 560-144.000.

International Standard Electric Corporation: *See*—
Epworth, Richard E., 4,533,247, Cl. 356-345.000.

International Telephone & Telegraph Corp.: *See*—
Anhalt, John W., 4,533,198, Cl. 339-99.00R.

Interox Chemicals Limited: *See*—
Farrell, George; Anderson, Diana M.; and Walton, Michael E., 4,533,527, Cl. 423-53.000.

Intili, Henry S., to Microban Products Company. Antimicrobial paper. 4,533,435, Cl. 162-161.000.

Irie, Yoichiro: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Yamamoto, Kiyonori; Watashi, Masahiro; Yoshinaga, Shinsuke; and Yamamoto, Toshihiko, 4,533,233, Cl. 355-8.000.

Isaksson, Karl, to Akermans Verkstad AB. Joystick controller with improved motion control with plate having bevelled flat edges that correspond to planes of maneuverability. 4,533,899, Cl. 338-128.000.

Iscar Ltd.: *See*—
Satran, Amir; and Elka, Shmuel, 4,533,283, Cl. 407-111.000.

Ishibe, Nobuyuki; Thomas, Renard L.; and Tasset, Emmett L., to Dow Chemical Company, The. Preparation of an improved catalyst for the manufacture of naphthoquinone. 4,533,653, Cl. 502-242.000.

Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,533,147, Cl. 277-26.000.

Ishii, Kiyoshi: *See*—
Ikezaki, Katsuji; and Ishii, Kiyoshi, 4,533,370, Cl. 55-276.000.

Ishikawa, Yasuyuki, to Canon Kabushiki Kaisha. Eye examining instrument. 4,533,222, Cl. 351-206.000.

Isovolta Osterreichische Isolierstoffwerke: *See*—
Mark, Hermann, 4,533,511, Cl. 264-184.000.

Istituto Luso Farmaco D'Italia s.p.a.: *See*—
Manghisi, Elso; and Cascio, Giuseppe, 4,533,748, Cl. 562-401.000.

Itek Corporation: *See*—
Aldrich, Ralph E., 4,533,219, Cl. 350-487.000.

Ito, Hiroshi: *See*—
Mizuno, Hiroshi; and Ito, Hiroshi, 4,532,902, Cl. 123-417.000.

Ito, Kazuo: *See*—
Obata, Saburo; and Ito, Kazuo, 4,533,273, Cl. 401-190.000.
Ito, Takeo: *See*—
Kurachi, Hisao; Ito, Takeo; Iwase, Takayuki; and Shiota, Junji, 4,533,267, Cl. 400-214.000.
Itoh, Haruo; Tokiguchi, Katsumi; Warabisako, Terunori; Saitoh, Tadashi; and Tokuyama, Takashi, to Hitachi, Ltd. Non-mass-analyzed ion implantation. 4,533,831, Cl. 250-492.200.
Itoh, Kazuhiro; Sugisaki, Mutsuo; and Tanaka, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Method of assembling a reciprocating compressor. 4,532,685, Cl. 29-156.40R.
Itoh, Kunio; Oshima, Toshimichi; and Nakamura, Tsutomu, to Shin-Etsu Chemical Co., Ltd. Flame-retardant rubber composition. 4,533,687, Cl. 524-80.000.
Itoh, Senji: *See*—
Tanahashi, Toshifumi; and Itoh, Senji, 4,533,576, Cl. 428-35.000.
Itoyama, Katumi: *See*—
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ITT Industries, Inc.: *See*—
Kramer, Peter K. G., 4,533,804, Cl. 200-159.00R.
Sauer, Wolfgang; Schmidtpott, Friedrich; Schat, Hermanus; and Freyberger, Laurin C., 4,533,879, Cl. 331-1.00A.
Iversen, Alfred L.: *See*—
Van Beek, Allen L.; and Iversen, Alfred L., 4,533,352, Cl. 604-317.000.
Ives, Kenneth D., to United States Steel Corporation. Continuous casting mold oscillator load indication system. 4,532,975, Cl. 164-150.000.
Iwabuchi, Takashi: *See*—
Miyata, Takeo; Ono, Takuhiro; and Iwabuchi, Takashi, 4,533,593, Cl. 428-215.000.
Iwagami, Fusao; and Yoshimura, Hisashi, to Sharp Kabushiki Kaisha. Capping mechanism for preventing nozzle blocking in an ink jet system printer. 4,533,927, Cl. 346-140.00R.
Iwahashi, Shoji; and Nakai, Ken, to Aisen Kogyo, Ltd. Shoulder patting means. 4,532,919, Cl. 128-54.000.
Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing a semiconductor device for forming a deep field region in a semiconductor substrate. 4,532,696, Cl. 29-571.000.
Iwai, Hiroshi: *See*—
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,532,701, Cl. 29-576.00W.
Iwai, Kiyoshi: *See*—
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Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, 4,533,547, Cl. 424-122.000.
Iwase, Takayuki: *See*—
Kurachi, Hisao; Ito, Takeo; Iwase, Takayuki; and Shiota, Junji, 4,533,267, Cl. 400-214.000.
Iwata, Tadao: *See*—
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Iyengar, Rama, to AT&T Technologies, Inc. Method and apparatus for coating optical waveguide fibers. 4,533,570, Cl. 427-163.000.
Izbicki, Anthony J.: *See*—
Wagner, Frederick B., III; and Izbicki, Anthony J., 4,533,415, Cl. 149-35.000.
Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for producing mesophase pitch. 4,533,461, Cl. 208-44.000.
J. I. Case Company: *See*—
Vater, George R.; and Allori, Aldo, 4,533,149, Cl. 277-221.000.
Jackman, Peter R.; and Thomas, Alan D., to First Inertia Switch Limited. Inertia switch device. 4,533,801, Cl. 200-61.45R.
Jackson, Maurus E. Butterfly carburetion system. 4,532,909, Cl. 123-590.000.
Jacob Berg KG: *See*—
Krautkramer, Gunter, 4,533,062, Cl. 220-258.000.
Jacobs, Robert M.: *See*—
Fletcher, Gerald M.; Jacobs, Robert M.; and Pietrowski, Kenneth W., 4,533,230, Cl. 355-3.0CH.
Jacobson, Earl B. Radiation attenuation modules and system and method of making the modules. 4,533,832, Cl. 250-519.100.
Jacquet, Joel: *See*—
Lamy, Jean-Michel; and Jacquet, Joel, 4,532,824, Cl. 74-475.000.
Jahnke, Frederick C.; and Crouch, William B., to Texaco Development Corporation. Production of synthesis gas. 4,533,363, Cl. 48-197.00R.
Jahnke, Richard W., to Lubrizol Corporation, The. Polycarboxylic acid/boric acid/amine salts and aqueous systems containing same. 4,533,481, Cl. 252-49.600.
James River-Dixie/Northern, Inc.: *See*—
Tao, Thomas, 4,533,507, Cl. 261-153.000.
Jamiolkowski, Dennis D.: *See*—
Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,532,928, Cl. 128-335.500.
Janata, Jiri: *See*—
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Janeba, Jaroslav: *See*—
Marsicek, Zdenek; Janeba, Jaroslav; Pacha, Antonin; Pastrnak, Ales; Dykast, Jaroslav; and Prazak, Roman, 4,534,042, Cl. 377-16.000.
Janes, Gary A.: *See*—
Andrews, Lawrence P.; Heath, Chester A.; Mead, Justin E.; Van-Duren, Richard G.; and Janes, Gary A., 4,534,011, Cl. 364-900.000.
Jankowski, Detlef: *See*—
von der Bey, Thomas; Jankowski, Detlef; Schmidt, Hartmut; Thoma, Klemens; and Volker, Wolfgang, 4,532,779, Cl. 62-514.00R.
Janome Sewing Machine Co. Ltd.: *See*—
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Janome Sewing Machine Industry Co., Ltd.: *See*—
Kongoh, Takeshi; and Tanaka, Haruhiko, 4,532,876, Cl. 112-454.000.
Jansky, Donald J.: *See*—
Moynagh, Eugene E., Jr.; and Jansky, Donald J., 4,533,204, Cl. 339-221.00R.
Janssen, Lutz J.; and Wulfing, Friedl W., to Ford Motor Company. Motor car with flow stepped tail and air-conducting means. 4,533,168, Cl. 296-1.00S.
Janssen Pharmaceutica: *See*—
Kennis, Ludo E. J.; Vandenberk, Jan; and Mertens, Josephus C., 4,533,665, Cl. 514-258.000.
Janssen Pharmaceutica, N.V.: *See*—
Heeres, Jan; and Mostmans, Joseph H., 4,533,550, Cl. 514-256.000.
Japan Exlan Company Limited: *See*—
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Japan Synthetic Rubber Co., Ltd.: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,533,711, Cl. 526-340.400.
Jarocki, Kathryn M.: *See*—
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Jasch, Gunter: *See*—
Neumann, Manfred; Morgner, Henry; Forster, Harry; Jasch, Gunter; Kunack, Wilfried; Godenschweg, Martin; and Unganz, Peter, 4,532,888, Cl. 118-718.000.
Jasinski, Joseph J. Illuminating device with mercury switch and adjustable abutment tab. 4,533,985, Cl. 362-276.000.
Jasperson, Carl R., to Rodgers, Lowell A.; and Rodgers, Vernon C. Film to panel registration device. 4,533,240, Cl. 355-125.000.
Jensen, Ole R., to E. R. Squibb & Sons, Inc. Medical drainage bag and non-return valve assembly. 4,533,354, Cl. 604-323.000.
Jeskey, Richard V., to Incom, Inc. Optical fiber light filter using elongated radiation absorbing elements. 4,533,210, Cl. 350-96.300.
Jessup, Peter J.: *See*—
Holstedt, Richard A.; and Jessup, Peter J., 4,533,480, Cl. 252-46.400.
Jeunet, Guy: *See*—
Boichut, Philippe; and Jeunet, Guy, 4,533,194, Cl. 339-91.00R.
Jewer, Alan A., to News Log International. Coded data on a record carrier and method for encoding same. 4,534,031, Cl. 371-38.000.
Jinnouchi, Katsumi, to Amada Company, Limited. Turret punch presses. 4,532,845, Cl. 83-552.000.
Jochum, Peter, to Hilti Aktiengesellschaft. Stop device for a driving piston in a fastening member setting device. 4,533,077, Cl. 227-156.000.
Johannes Heidenhain GmbH: *See*—
Vollmayr, Norbert, 4,534,004, Cl. 364-486.000.
John Harder & Co.: *See*—
Harder, John O.; McCandless, Doyle W.; and Peterson, Michael W., 4,532,689, Cl. 29-426.500.
Johnson, A. Neil; and Taylor, Philip A., to G.R. Systems, Inc. Portable seam welding machine for thermoplastic sheets. 4,533,423, Cl. 156-359.000.
Johnson, Clyde O.: *See*—
Miranti, Joseph P., Jr.; Oliver, Larry R.; and Johnson, Clyde O., 4,533,342, Cl. 474-201.000.
Johnson, Harold L., to Milliken Research Corporation. D. C. Yarn tension control. 4,532,760, Cl. 57-283.000.
Johnson, Robert G., to Honeywell Inc. Robotics manipulator with gripping force control means. 4,533,167, Cl. 294-86.400.
Johnsson, Bo A.; Losell, Ingvar E.; and Palmqvist, Sune H., to Gambro Cardio AB. Apparatus for the transfer of one or more substances between a gas and a liquid. 4,533,516, Cl. 422-46.000.
Johnston, Everett A.: *See*—
Bonini, Bruno; Cook, Raymond G.; Holdren, Carl F.; and Johnston, Everett A., 4,533,098, Cl. 244-110.00B.
Johnston, James J.; and Glynn, Gregory L., to Akzona Incorporated. Electrical conductor assembly. 4,533,790, Cl. 174-115.000.
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Johnstone, Richard, to Kearney & Trecker Corporation. Motorized ball nut. 4,533,859, Cl. 318-661.000.
Jokel, Isidore. Window intrusion barrier. 4,532,734, Cl. 49-55.000.
Jones, Cecil M., to Norton Company. Mortar. 4,533,644, Cl. 501-17.000.
Jones, Clarence L., to Pitre-Jones. Process for producing blended d-Limonene and uses of the blended product. 4,533,487, Cl. 252-170.000.
Jones, Corey N.; and Hawkins, Patricia A., to PSI Associates, Inc. Educational device for teaching the proper placement of information. 4,533,329, Cl. 434-219.000.
Jones, Dwight V., to General Electric Company. Compact electrical power supply for signal processing applications. 4,533,986, Cl. 363-17.000.

Jones, Lawrence S.: *See*—
Battle, Billy J.; and Jones, Lawrence S., 4,532,957, Cl. 137-375.000.
Jones, Patrick M.: *See*—
Wilson, Louis D.; and Jones, Patrick M., 4,532,804, Cl. 73-478.000.
Jones, Richard O. Pet feeder assembly. 4,532,891, Cl. 119-51.0FS.
Jorgensen, Charles A., to Everede Tool Company. Cutting attachment for boring tool. 4,533,285, Cl. 408-191.000.
Josquin, Wilhelmus J. M. J., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,533,429, Cl. 156-643.000.
Jost, Jochen: *See*—
Klose, Odo; and Jost, Jochen, 4,532,727, Cl. 40-152.000.
Juarez, Manuel; and Preston, Neil, to Juarez, Manuel. Electronic game. 4,533,144, Cl. 273-311.000.
Junttila, Jack D., to Atlantic Richfield Company. Process for grinding graphite. 4,533,086, Cl. 241-16.000.
Kaas, Werner: *See*—
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Kabushiki Kaisha Daikin Seisakusho: *See*—
Hamada, Tooru, 4,533,338, Cl. 464-64.000.
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Kabushiki Kaisha Daini Seikosha: *See*—
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Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
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Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nishida, Kenji, 4,533,291, Cl. 414-728.000.
Kabushiki Kaisha Murao Shoten: *See*—
Murao, Masami, 4,532,682, Cl. 24-616.000.
Kabushiki Kaisha SUIDEN: *See*—
Nakamura, Katsutoshi, 4,533,371, Cl. 55-299.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Yokozawa, Yukio, 4,534,012, Cl. 364-900.000.
Kabushiki Kaisha Suwa Siekosha: *See*—
Kitano, Masuo; and Yoshino, Masahito, 4,533,257, Cl. 368-202.000.
Kabushiki Kaisha Taiyo Hatsujyo Seisakusho: *See*—
Hashimoto, Seiichi, 4,532,680, Cl. 24-67.00R.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Hayakawa, Kizo; Mori, Nobuyuki; Watanabe, Yoshio; and Nakashima, Kazumi, 4,532,898, Cl. 123-276.000.
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Hayakawa, Kizo; Mori, Nobuyuki; Watanabe, Yoshio; and Nakashima, Kazumi, 4,532,898, Cl. 123-276.000.
Kaczkos, John E.: *See*—
Koppensteiner, James V.; and Kaczkos, John E., 4,533,977, Cl. 361-415.000.
Kakinuma, Hiroaki; Yoshida, Mamoru; and Nishikawa, Satoshi, to Oki Electric Industry Co., Ltd. Method of manufacturing an electrophotographic photoreceptor. 4,533,564, Cl. 427-39.000.
Kalbfell, Heinz: *See*—
Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, 4,533,755, Cl. 568-454.000.
Kali-Chemie Aktiengesellschaft: *See*—
Weidenbach, Gunter; Bonse, Dirk; and Meyer, Boris, 4,533,633, Cl. 435-94.000.
Kali-Chemie Pharma GmbH: *See*—
Zeugner, Horst; Roemer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, 4,533,662, Cl. 514-221.000.
Kalish, Richard J.: *See*—
Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., 4,533,544, Cl. 424-52.000.
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing semiconductor device. 4,532,701, Cl. 29-576.00W.
Kaminski, Tony L.: *See*—
Schemelin, Michael P.; Kaminski, Tony L.; and Shupert, Paul T., 4,532,755, Cl. 56-16.600.
Kan, Mikio: *See*—
Yamane, Isao; Kan, Mikio; and Minamoto, Yoshiki, 4,533,637, Cl. 435-240.000.
Kanehara, Hironori: *See*—
Maruyama, Hiromi; Sasaoka, Seiji; Kiuchi, Mitsuo; and Kanehara, Hironori, 4,533,557, Cl. 426-61.000.
Kaneko, Tadashi: *See*—
Yokooku, Katsuhiko; Kaneko, Tadashi; and Nakazumi, Tadataka, 4,532,905, Cl. 123-443.000.
Kanzaki Paper Manufacturing Company, Ltd.: *See*—
Shioi, Shunshuke; Takekawa, Yasuo; and Miyake, Makoto, 4,533,930, Cl. 346-211.000.
Kao Corporation: *See*—
Takaishi, Naotake; Takahashi, Hitoshi; and Inamoto, Yoshiaki, 4,533,770, Cl. 568-817.000.
Kaplan, Steven B.: *See*—
Ghoewala, Tushar R.; and Kaplan, Steven B., 4,533,840, Cl. 307-306.000.
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., to Continental White Cap, Inc. Vacuum-tamper indicating button for smaller diameter caps and the like. 4,533,059, Cl. 215-230.000.
Kapoor, Deepak; Wan, Chung-Chu; and Wang, Rong Y., to Allied Corporation. Boron containing rapid solidification alloy and method of making the same. 4,533,389, Cl. 75-123.00B.
Kapp & Co. Werkzeugmaschinenfabrik: *See*—
Lorenz, Manfred, 4,533,812, Cl. 219-121.0LH.
Karakawa, Tadashi: *See*—
Kondo, Takashi; Sakai, Chikaaki; and Karakawa, Tadashi, 4,533,359, Cl. 8-128.00R.
Karanewsky, Donald S., to E. R. Squibb & Sons, Inc. Certain 3-phosphinyl-amino-2-oxo-1H-azepine-1-acetic acid derivatives having anti-hypertensive activity. 4,533,661, Cl. 514-212.000.
Karl Schmidt GmbH: *See*—
Gleichaut, Winfried; Gunther, Oswin; Hoffmann, Dietrich; and Funke, Rolf, 4,532,868, Cl. 102-527.000.
Karol, Thomas J.: *See*—
Sung, Rodney L.; and Karol, Thomas J., 4,533,361, Cl. 44-73.000.
Kartridg Pak Co., The: *See*—
Leonard, George E., 4,532,968, Cl. 141-5.000.
Kaster, Robert L., to Angicor Limited. Prosthetic heart valve with plano-convex disk occluder. 4,532,659, Cl. 623-2.000.
Kasuga, Takuzo; and Takahashi, Katsuhiko, to Polyplastic Company, Ltd. Thermoplastic resin composition for molding. 4,533,680, Cl. 523-220.000.
Katada, Kunio: *See*—
Masuhara, Hideki; Katada, Kunio; and Kudo, Uichi, 4,533,892, Cl. 336-147.000.
Katagiri, Hidenori: *See*—
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,382, Cl. 75-0.50C.
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Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,413, Cl. 148-420.000.
Katko , Laszlo : *See*—
Gal, Jozsef; Gyarfas, Andras; Katko , Laszlo ; Racz, Gabor; Sarlos, Agoston; and Vozari, Gyula, 4,533,912, Cl. 340-783.000.
Kato, Kaneyoshi: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, 4,533,554, Cl. 514-464.000.
Katoh, Osamu: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Katoh, Osamu, 4,533,535, Cl. 423-447.400.
Katz, Carlos, to Cable Technology Laboratories, Inc. High voltage electric power cable with thermal expansion accommodation. 4,533,789, Cl. 174-102.00R.
Kaufman, Harry J. Well casing float shoe or collar. 4,532,995, Cl. 166-327.000.
Kaufman, Jack W.: *See*—
Blake, Joseph W., III, 4,532,925, Cl. 128-325.000.
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, to GAO Gesellschaft fur Automation und Organisation mbH. Process for authenticity determination of security documents with security features in the form of luminescing substances. 4,533,244, Cl. 356-71.000.
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, to Bristol-Myers Company. Fermentation process for preparation of antibiotic Bu-2517. 4,533,631, Cl. 435-70.000.
Kawaguchi, Toshio: *See*—
Kusumoto, Koshi; Kawaguchi, Toshio; and Ogata, Takayuki, 4,533,701, Cl. 525-370.000.
Kawai, Akira: *See*—
Okumura, Fumio; and Kawai, Akira, 4,533,599, Cl. 428-402.210.
Kawai, Hisasi: *See*—
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,533,847, Cl. 310-181.000.
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; and Tokoro, Setsuo, 4,532,798, Cl. 73-116.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,532,848, Cl. 84-1.190.
Kawakubo, Hiromu: *See*—
Ibuki, Tadayuki; Sugihara, Taisuke; Kawakubo, Hiromu; and Sone, Takanori, 4,533,731, Cl. 544-140.000.
Kawamata, Kiyoshi; and Kawamata, Seizi, to Nihon Seikan Kabushiki Kaisha. Can and closure structure. 4,533,064, Cl. 220-273.000.
Kawamata, Masanobu; Ushimaru, Koichi; Goshi, Hiroyuki; and Miyasako, Hideichi, to Nippon Shinyaku Co., Ltd. Stabilization of azulene derivatives. 4,533,552, Cl. 424-78.000.
Kawamata, Seizi: *See*—
Kawamata, Kiyoshi; and Kawamata, Seizi, 4,533,064, Cl. 220-273.000.
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Disazo compounds and photoconductive composition as well as electrophotographic light sensitive element containing the same. 4,533,613, Cl. 430-78.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nagata, Osamu; Inagaki, Masanari; and Yamada, Hajime, 4,532,877, Cl. 114-144.00E.
Kawasaki Steel Corporation: *See*—
Kawasaki, Tatsuo; Takada, Isao; and Ohtsubo, Hiroshi, 4,533,806, Cl. 219-8.500.
Kawasaki, Tatsuo; Takada, Isao; and Ohtsubo, Hiroshi, to Kawasaki Steel Corporation. Method of manufacturing bimetallic tubes. 4,533,806, Cl. 219-8.500.

Kawasumi, Masashi: *See*—
Kishi, Hajimu; Seki, Masaki; and Kawasumi, Masashi, 4,533,286, Cl. 409-80.000.

Kay, Robert M.: *See*—
Callaghan, Timothy J.; and Kay, Robert M., 4,533,250, Cl. 356-350.000.

Keane, John F.; Butler, John C.; and Archer, Timothy H., to Coulter Systems Corporation. Method and apparatus for half-tone reproduction of a varying tone original image. 4,533,941, Cl. 358-75.000.

Kearney & Trecker Corporation: *See*—
Johnstone, Richard, 4,533,859, Cl. 318-661.000.

Keeling, Harmon H.: *See*—
Hudspeth, Thomas; and Keeling, Harmon H., 4,533,883, Cl. 333-1.000.
Hudspeth, Thomas; and Keeling, Harmon H., 4,533,884, Cl. 333-26.000.

Kehoe, Steven D.: *See*—
Walton, Herbert H.; and Kehoe, Steven D., 4,532,961, Cl. 137-625.310.

Keinborg, Maurice: *See*—
Leroy, Michel; and Keinborg, Maurice, 4,533,452, Cl. 204-243.00R.

Kelen, George J., to Del Mar Avionics. Pacemaker monitoring recorder and malfunction analyzer. 4,532,934, Cl. 128-697.000.

Kelley, Lewis J., to Minnesota Mining and Manufacturing Company. Integrated circuit test socket. 4,533,192, Cl. 339-45.00M.

Kellie, Truman F.; Landry, J. David; and Lai, Ching C., to General Electric Company. Optical inspection system. 4,532,723, Cl. 356-73.000.

Kelly, John H., to Stelco Inc. Metal analysis for acid-soluble elements. 4,533,642, Cl. 436-78.000.

Kemppi Oy: *See*—
Makimaa, Tapani, 4,533,817, Cl. 219-137.710.

Kennecott Corporation: *See*—
Nunlist, Erwin J., 4,532,885, Cl. 118-308.000.

Kenney, Richard E. H. Ticket holders for shelving. 4,532,726, Cl. 40-16.400.

Kennis, Ludo E. J.; Vandenberk, Jan; and Mertens, Josephus C., to Janssen Pharmaceutica. [[Bis(aryl)methylene]-1-piperidinyl]alkylpyrimidinones. 4,533,665, Cl. 514-258.000.

Kenny, Garry R.; Sommer, Edward J., Jr.; and Roos, Charles E., to Magnetic Separation Systems, Inc. Rotary drum magnetic separator. 4,533,053, Cl. 209-636.000.

Kenny, Garry R.: *See*—
Sommer, Edward J., Jr.; Kenny, Garry R.; and Roos, Charles E., 4,533,054, Cl. 209-687.000.

Kenny, George S.: *See*—
Wiggins, Ralphe; Kenny, George S.; and McClure, Carroll D., 4,534,019, Cl. 367-75.000.

Kerekes, Peter: *See*—
Brossi, Arnold; and Kerekes, Peter, 4,533,675, Cl. 514-480.000.

Keritsis, Gus D., to Philip Morris Incorporated. Process for increasing and maintaining the filling power of tobacco. 4,532,945, Cl. 131-291.000.

Kernforschungsanlage Julich GmbH: *See*—
Iniotakis, Nicolaos; and von der Decken, Claus-Benedict, 4,533,539, Cl. 423-648.00A.
Ringel, Helmut, 4,533,365, Cl. 55-28.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Vejmelka, Peter; Kluger, Wolfgang; Koster, Rainer; and Hauser, Wolfgang, 4,533,395, Cl. 106-89.000.

Kerr, James F., to Material Control, Inc. Telescoping conveyor belt cleaner. 4,533,037, Cl. 198-499.000.

Kershaw, Thomas N.: *See*—
Curran, John F.; and Kershaw, Thomas N., 4,533,437, Cl. 162-281.000.

Keskey, William H.: *See*—
Walles, Wilhelm E.; Keskey, William H.; and Young, Richard G., 4,533,484, Cl. 252-117.000.

Kessen, Gunther: *See*—
Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, 4,533,755, Cl. 568-454.000.

Khalil, Hamdy; and Chick, Orest N., to Polysar Limited. Chlorine dioxide antimicrobial agent for latex. 4,533,691, Cl. 524-401.000.

Kibby, Robert M., to Process Development Associates, Inc. Process for producing aluminum. 4,533,386, Cl. 75-10.00R.

Kidd, Patrick D.; Sterrett, Terry L.; and Andreiko, Craig A., to Sybron Corporation. Braided elastomer orthodontic tensioning device. 4,533,321, Cl. 433-18.000.

Kikkawa, Ikuo: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,533,730, Cl. 544-92.000.

Kikuchi, Juro: *See*—
Kurita, Hiroyuki; Kobayashi, Yuko; Dosaka, Shinichi; Kikuchi, Juro; Takase, Hiroshi; and Harada, Kenichi, 4,533,220, Cl. 350-507.000.

Kikuta, Kazutsune: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Uwai, Toshihiro; Matsuda, Kenji; and Hattori, Nobutaka, 4,533,705, Cl. 526-114.000.

Killich, Hans-Jurgen: *See*—
Leibrock, Kurt; and Killich, Hans-Jurgen, 4,533,002, Cl. 173-53.000.

Kim, Bang M., to General Electric Company. Method for continuous measurement of the sulfite/sulfate ratio. 4,533,440, Cl. 204-1.00T.

Kim, Sam K. Pivot mechanism for multiple axes opening window or closure. 4,532,673, Cl. 16-233.000.

Kimball, John J.: *See*—
Roule, Richard L.; Sorbo, Peter J.; and Kimball, John J., 4,533,586, Cl. 428-137.000.

Kimbara, Hidenori: *See*—
Gaku, Morio; Kimbara, Hidenori; Ayano, Satoshi; and Yoshimura, Susumu, 4,533,727, Cl. 528-361.000.

Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., to Phillips Petroleum Company. Ore flotation and flotation agents for use therein. 4,533,467, Cl. 209-167.000.

Kimmel, Steven A., to Robertshaw Controls Company. Electrical circuit for a cooking apparatus and method of making the same. 4,533,973, Cl. 361-253.000.

Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Yamamoto, Kiyonori; Watashi, Masahiro; Yoshinaga, Shinsuke; and Yamamoto, Toshihiko, to Mita Industrial Co., Ltd. Electrostatic copying apparatus. 4,533,233, Cl. 355-8.000.

Kimura, Yoshiharu: *See*—
Taniguchi, Isoji; Kimura, Yoshiharu; and Ichimura, Toshiaki, 4,533,712, Cl. 528-9.000.

Kinard, George P., to Core-Form. Channel and foam block wall construction. 4,532,745, Cl. 52-251.000.

King, Francis D.: *See*—
Blaney, Francis E.; Hadley, Michael S.; King, Francis D.; and Watts, Eric A., 4,533,498, Cl. 260-243.300.

King, Frank C., Jr., to Philip Morris Incorporated. Method and apparatus for tipping tobacco leaves packed in bales. 4,532,946, Cl. 131-327.000.

King, George R.: *See*—
Baker, Edward H.; and King, George R., 4,532,681, Cl. 403-28.000.

King, Richard M.: *See*—
Corrigan, Patrick J.; King, Richard M.; and VanDiest, Scott A., 4,533,648, Cl. 502-38.000.

King-Seeley Thermos Co.: *See*—
Spinner, Joseph R., 4,533,310, Cl. 425-376.00R.

King, William F., to Chevron Research Company. Insecticidal 3-alkyl-5-(alkoxy- or alkylthio-phosphynyl or phosphinothioyl-thiomethyl)-1,2,4-oxadiazoles. 4,533,658, Cl. 514-92.000.

Kingston, Charles M.: *See*—
Eby, John E.; and Kingston, Charles M., 4,533,944, Cl. 358-107.000.

Kington, Alan D.: *See*—
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,532,974, Cl. 164-132.000.

Kinney, Philip C.; Imran, Mir; and Donnelly, Edward J., to Phyronics, Inc. Distance measuring device for golf carts and the like. 4,532,710, Cl. 33-141.00E.

Kinney, Wayne I.; Lasky, Jerome B.; and Nesbit, Larry A., to International Business Machines Corporation. Method of manufacturing semiconductor structures having an oxidized porous silicon isolation layer. 4,532,700, Cl. 29-576.00W.

Kioritz Corporation: *See*—
Nagashima, Akira; and Kondo, Tadashige, 4,534,005, Cl. 364-505.000.

Kirkman, Michael, to Augat Inc. Dual beam connector. 4,533,187, Cl. 339-17.0CF.

Kirkpatrick, Conilee G.; Adler, Michael S.; and Possin, George E., to United States of America, Air Force. Beam addressed memory system. 4,534,016, Cl. 365-128.000.

Kishi, Hajimu; Seki, Masaki; and Kawasumi, Masashi, to Fanuc Ltd. Tool compensation method. 4,533,286, Cl. 409-80.000.

Kishi, Ikuo; and Yoshida, Hideo, to Lederle (Japan), Ltd. Antiinflammatory analgesic gelled ointments. 4,533,546, Cl. 424-81.000.

Kitahara, Yoshimi: *See*—
Fukuda, Kazumasa; and Kitahara, Yoshimi, 4,533,603, Cl. 428-458.000.

Kitano, Kisei: *See*—
Fukui, Masahiro; Kitano, Kisei; Tanaka, Masami; and Goto, Yasuyuki, 4,533,488, Cl. 252-299.610.

Kitano, Masuo; and Yoshino, Masahito, to Kabushiki Kaisha Suwa Siekosha. Analog electric timepiece. 4,533,257, Cl. 368-202.000.

Kitasato Institute, The: *See*—
Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, 4,533,547, Cl. 424-122.000.
Umezawa, Iwao; and Komiyama, Kanki, 4,533,548, Cl. 514-54.000.

Kiuchi, Mitsuo: *See*—
Maruyama, Hiromi; Sasaoka, Seiji; Kiuchi, Mitsuo; and Kanehara, Hironori, 4,533,557, Cl. 426-61.000.

Kiya, Nobuyuki: *See*—
Nozawa, Ryoichiro; and Kiya, Nobuyuki, 4,534,001, Cl. 364-474.000.

Klauke, Erich: *See*—
Baasner, Bernd; Hagemann, Hermann; and Klauke, Erich, 4,533,776, Cl. 568-946.000.
Marhold, Albrecht; and Klauke, Erich, 4,533,777, Cl. 570-144.000.
Sirrenberg, Wilhelm; Klauke, Erich; and Hammann, Ingeborg, 4,533,676, Cl. 514-535.000.

Kleemann, Axel: *See*—
Drauz, Karlheinz; and Kleemann, Axel, 4,533,766, Cl. 568-771.000.

Klein, Werner; and Leo, Heinz, to Messer Griesheim GmbH. Welding and/or cutting torch. 4,533,078, Cl. 228-45.000.

Klittich, Klaus. Feeding bottle with tubular housing for clamping flexible container. 4,533,057, Cl. 215-11.00E.

Klockner-Humboldt-Deutz AG: *See*—
Herchenbach, Horst; and Ramesohl, Hubert, 4,533,396, Cl. 106-100.000.
Klose, Odo; and Jost, Jochen, to FILMOSTO-PROJEKTION Johannes Jost GmbH & Co. Frame, especially a quick-change frame for photographs. 4,532,727, Cl. 40-152.000.
Kluger, Wolfgang: *See*—
Vejmelka, Peter; Kluger, Wolfgang; Koster, Rainer; and Hauser, Wolfgang, 4,533,395, Cl. 106-89.000.
Kluth, Hermann; Roderhoff, Bernhard; Friedemann, Wolfgang; Wegner, Jurgen; and Dierichs, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Process for producing water glass foams from aerosol containers. 4,533,490, Cl. 252-305.000.
Knecht, Todd: *See*—
Elliott, Thomas; and Knecht, Todd, 4,533,280, Cl. 406-57.000.
Knickerbocker, Robert H., to Siemon Company, The. Pre-wired modular connecting blocks. 4,533,195, Cl. 339-97.00P.
Knifton, John F.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,533,742, Cl. 549-475.000.
Knight, John C.: *See*—
Tilson, Alan L.; Quay, Earl R.; and Knight, John C., 4,532,780, Cl. 66-9.00B.
Knight, Michael W., to AMF Incorporated. Relays and method for mounting relays on printed circuit boards. 4,533,889, Cl. 335-199.000.
Knight, Reed H.; and Longmore, Val L. Portable multiple spool wire dispenser. 4,533,091, Cl. 242-129.600.
Knoll International, Inc.: *See*—
Latone, Thomas L., 4,533,177, Cl. 297-301.000.
Knorr-Bremse GmbH: *See*—
Krause, Friedrich, 4,533,185, Cl. 303-3.000.
Knudel, Gunter, to Volkswagenwerk Aktiengesellschaft. Window pane mounting for vehicles. 4,532,741, Cl. 52-99.000.
Ko, Ping K., to AT&T Bell Laboratories. Silicon gigabit metal-oxide-semiconductor device processing. 4,532,697, Cl. 29-571.000.
Kobashi, Toshiyuki; and Naka, Hideo, to Japan Exlan Company Limited. Method of producing colloidal antimony oxide. 4,533,538, Cl. 423-617.000.
Kobayashi, Masahito; Maeda, Narimichi; Hagiwara, Yoshimune; Akazawa, Takashi; and Sugiyama, Shizuo, to Hitachi, Ltd.; and Hitachi Denshi Kabushiki Kaisha. Floating point type multiplier circuit with compensation for over-flow and under-flow in multiplication of numbers in two's compliment representation. 4,534,010, Cl. 364-748.000.
Kobayashi, Tatsuhiko: *See*—
Ikeuchi, Satoru; Inaba, Yoshihiro; Shimazaki, Hiroshi; and Kobayashi, Tatsuhiko, 4,533,621, Cl. 430-213.000.
Kobayashi, Yuko: *See*—
Kurita, Hiroyuki; Kobayashi, Yuko; Dosaka, Shinichi; Kikuchi, Juro; Takase, Hiroshi; and Harada, Kenichi, 4,533,220, Cl. 350-507.000.
Kobiella, Robert J., to Signode Corporation. Article strapping method and apparatus, chain assembly for such apparatus and for other apparatus, and method for making such chain assembly. 4,533,343, Cl. 474-207.000.
Kocher, Robert C.: *See*—
French, Kenneth; Kocher, Robert C.; Piorkow, Alfred; Shaner, Kenneth; and Smith, J. Thomas, 4,533,251, Cl. 356-384.000.
Koehring Company: *See*—
Thomas, David; and Briggs, Eugene C., 4,532,914, Cl. 126-110.00C.
Koetje, John R. Expandable connector and method of using same to form curved structural framework. 4,532,747, Cl. 52-586.000.
Koga, Toshiyuki, to Kabushiki Kaisha Daini Seikosha. Fluorescent X-ray film thickness gauge. 4,534,049, Cl. 378-050.000.
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; and Tokoro, Setsuo, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Measurement of variations in internal combustion engine output. 4,532,798, Cl. 73-116.000.
Kohno, Takashige: *See*—
Osawa, Tadao; Nakagawa, Toru; Okumura, Masamitsu; Kohno, Takashige; and Sakuma, Tokihiko, 4,532,904, Cl. 123-439.000.
Kohzato, Yasuo: *See*—
Sugiura, Susumu; and Kohzato, Yasuo, 4,533,928, Cl. 346-140.00R.
Koiwa, Atsushi: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.
Koizumi, Takashi: *See*—
Tanaka, Yoshio; Nishikawa, Yasuhisa; Hasumi, Ryoichi; and Koizumi, Takashi, 4,532,818, Cl. 74-10.330.
Kojima, Hisao. Sound arresting device. 4,533,015, Cl. 181-280.000.
Kojima, Junpei: *See*—
Shiga, Akinobu; Sasaki, Toshio; and Kojima, Junpei, 4,533,706, Cl. 526-119.000.
Kojima, Ryuji; and Yazaki, Akiko, to Parker Chemical Company. Test method for phosphate coatings. 4,533,639, Cl. 436-2.000.
Kojima, Yasuhiko: *See*—
Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, 4,533,547, Cl. 424-122.000.
Kokogawa Hokushin Electric Corporation: *See*—
Hanaoka, Yuzuru; Murayama, Takeshi; Muramoto, Setsuo; and Matsuura, Tamizo, 4,533,518, Cl. 422-70.000.
Kokoku Rubber Industrial Company Limited: *See*—
Honda, Kazuhiro; and Kuramochi, Hiroshi, 4,533,604, Cl. 428-521.000.
Kolbas, Robert M., to Honeywell Inc. Method of fabricating emitter/detector-in-a-well for the integration of electronic and optoelectronic components. 4,532,694, Cl. 29-569.00L.
Kollmorgan Technologies Corp.: *See*—
Teng, Yu-Ling; McCoy, Charles; DeFalco, Francis; and Mayernick, Richard, 4,533,606, Cl. 428-658.000.
Komai, Takeshi; Matsuyama, Kazuo; and Saigo, Takuya, to Nippon Oil & Fats Co., Ltd. Copolymerized unsaturated peroxycarbonate sizing agent for treatment of glass fibers and method for treatment of glass fibers with said sizing agent. 4,533,699, Cl. 525-277.000.
Komesker, Heinrich; and Helmes, Ludger, to Vorwerk & Co. Interholding GmbH. Floor cleaning device having a replaceable brush assembly. 4,532,667, Cl. 15-49.00C.
Komiyama, Kanki: *See*—
Umezawa, Iwao; and Komiyama, Kanki, 4,533,548, Cl. 514-54.000.
Komoda, Norio, to Toyota Jidosha Kabushiki Kaisha. Intake device of an internal combustion engine. 4,533,012, Cl. 180-68.300.
Konan Camera Research Institute: *See*—
Okano, Takeshi, 4,533,253, Cl. 356-443.000.
Kondo, Hirokazu; and Takino, Shigekatsu, to Tsubakimoto Chain Company. Pallet conveying system. 4,532,869, Cl. 104-166.000.
Kondo, Tadashige: *See*—
Nagashima, Akira; and Kondo, Tadashige, 4,534,005, Cl. 364-505.000.
Kondo, Takashi; Sakai, Chikaaki; and Karakawa, Tadashi, to Kurashiki Boseki Kabushiki Kaisha. Process for modifying animal fibers. 4,533,359, Cl. 8-128.00R.
Kondo, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device with enlarged corners to provide enhanced punch through protection. 4,533,932, Cl. 357-13.000.
Kong, Pi-Chang: *See*—
Rochon, Fernande D.; and Kong, Pi-Chang, 4,533,502, Cl. 546-8.000.
Kongoh, Takeshi; and Tanaka, Haruhiko, to Janome Sewing Machine Industry Co., Ltd. Electronic sewing machine. 4,532,876, Cl. 112-454.000.
Konishi, Masataka: *See*—
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,533,631, Cl. 435-70.000.
Konishi, Masayuki: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.
Konishi, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. MOS logic circuit responsive to an irreversible control voltage for permanently varying its signal transfer characteristic. 4,533,841, Cl. 307-468.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Ikeuchi, Satoru; Inaba, Yoshihiro; Shimazaki, Hiroshi; and Kobayashi, Tatsuhiko, 4,533,621, Cl. 430-213.000.
Konkol, Werner: *See*—
Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, 4,533,755, Cl. 568-454.000.
Koon, Norman C. Preparation of hard magnetic alloys of a transition metal and lanthanide. 4,533,408, Cl. 148-103.000.
Koppensteiner, James V.; and Kaczkos, John E., to GTE Communication Systems Corporation. Printed wiring board assembly employing track engaging runners. 4,533,977, Cl. 361-415.000.
Kordomenos, Panagiotis I.; Dervan, Andrew H.; and Grebur, Dennis J., to Ford Motor Company. Thermosetting coating composition useful as primer and chip resistant primer II. 4,533,534, Cl. 523-436.000.
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Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., to Ford Motor Company. Flexible basecoat/two component clearcoat coating composition. 4,533,703, Cl. 525-440.000.
Kordomenos, Panagiotis I.: *See*—
Alexander, Delores J.; Kurple, Kenneth R.; and Kordomenos, Panagiotis I., 4,533,704, Cl. 525-440.000.
Koster, Rainer: *See*—
Vejmelka, Peter; Kluger, Wolfgang; Koster, Rainer; and Hauser, Wolfgang, 4,533,395, Cl. 106-89.000.
Kource, Robert D.: *See*—
Gee, Gary W.; Shumate, Daniel L.; Nieder, John J.; Bump, Boyd E.; and Kource, Robert D., 4,532,815, Cl. 73-864.630.
Kovacs, Lloyd, to Hayssen Manufacturing Company. Method of and apparatus for forming, filling and sealing packages. 4,532,753, Cl. 53-451.000.
Kowalczyk, Ronald: *See*—
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.
Kowalik, Joseph W.; and Krueger, David J., to Littelfuse, Inc. Time delay fuse. 4,533,895, Cl. 337-165.000.
Kowalski, Walter C.: *See*—
Bishop, Ralph L.; Rich, William N.; and Kowalski, Walter C., 4,533,894, Cl. 337-107.000.
Koyama, Hiroshi: *See*—
Ohno, Akira; Koyama, Hiroshi; Inoue, Kanji; and Ozawa, Hiroaki, 4,533,402, Cl. 148-12.400.

Kozar, John J. Flashlight with swivelling head. 4,533,982, Cl. 362-183.000.
Kraft, Howard R., to T. O. Plastics, Inc. Grooved plastic board and method of making same. 4,533,588, Cl. 428-167.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Bezold, Helmut, 4,532,793, Cl. 72-342.000.
Kramer, Carl; and Kuster, Hans-Werner, to Saint Gobain Vitrage. Method and apparatus for uniformly coating a substrate with a powder. 4,533,571, Cl. 427-180.000.
Kramer, Charles D.: *See*—
Rivers, John; Kramer, Charles D.; and Cox, Robert L., 4,532,873, Cl. 110-347.000.
Kramer, Peter K. G., to ITT Industries, Inc. Push button slide switch. 4,533,804, Cl. 200-159.00R.
Kranich, Neil J., II; and Boivin, Wallace E., Jr., to ASEA Electric, Inc. Low voltage rotary tap changer. 4,533,797, Cl. 200-11.0TC.
Kratochvil, Jiri; and Janata, Jiri, to Critikon. Oxygen sensor for rapid blood gas analysis. 4,533,456, Cl. 204-415.000.
Kratzenberg, Wolfgang; and Baeslack, Bernd, to Wegmann & Co. GmbH. Apparatus for the supervision of a combat vehicle, especially an armored vehicle. 4,533,327, Cl. 434-20.000.
Krause, Friedrich, to Knorr-Bremse GmbH. Control system for electropneumatic compressed air brakes for rail vehicles. 4,533,185, Cl. 303-3.000.
Krautkramer, Gunter, to Jacob Berg KG. Container closure for supplying air to or removing air from a container. 4,533,062, Cl. 220-258.000.
Kreil, Curtis L.: *See*—
Evans, Jack L.; Campbell, Karen J.; Kreil, Curtis L.; and Sidney, LuAnn, 4,533,566, Cl. 427-44.000.
Kreuzer, Justin: *See*—
Deschenaux, Warren; Hughes, Gregory; Kreuzer, Justin; and La Fiandra, Carlo, 4,534,047, Cl. 378-35.000.
Kriegel, Ernst: *See*—
Coenen, Hubert; and Kriegel, Ernst, 4,532,992, Cl. 166-267.000.
Krikorian, George. Shelf and bracket therefor. 4,533,056, Cl. 211-153.000.
Krishnan, Vedavalli G., to Racal Data Communications, Inc. Test tone detector apparatus and method modem using same. 4,534,043, Cl. 375-104.000.
Krob, Erwin; and Bauer, Helmut, to TMC Corporation. Safety ski binding. 4,533,155, Cl. 280-628.000.
KRONE GmbH: *See*—
Forberg, Horst; Achtnig, Klaus-Peter; Hegner, Gunter; and Boes, Gerhard, 4,533,196, Cl. 339-97.00P.
Kronos Titan, GmbH: *See*—
Hartmann, Achim, 4,533,530, Cl. 423-240.000.
Krueger, David J.: *See*—
Kowalik, Joseph W.; and Krueger, David J., 4,533,895, Cl. 337-165.000.
Krul, William R., to Board of Governors for Higher Education, State of Rhode Island, The; and Providence Plantations. In vitro propagation of grape. 4,532,733, Cl. 47-58.000.
Krumin, Donald K.; and Larson, Orville W., to Motorola, Inc. Paging receiver and supporting receptacle therefor. 4,534,063, Cl. 455-344.000.
Ku, Thomas W.: *See*—
Gleason, John G.; Hall, Ralph F.; and Ku, Thomas W., 4,533,747, Cl. 560-152.000.
Kubicki, Michael J.: *See*—
Fruchey, Melvin C.; and Kubicki, Michael J., 4,533,052, Cl. 206-602.000.
Kudo, Uichi: *See*—
Masuhara, Hideki; Katada, Kunio; and Kudo, Uichi, 4,533,892, Cl. 336-147.000.
Kudoh, Michio: *See*—
Matsuno, Mitsuo; Kudoh, Michio; and Imai, Hiroshuke, 4,533,781, Cl. 585-516.000.
Kueny, Don F., to Outboard Marine Corporation. Primer follow-through system. 4,532,895, Cl. 123-187.50R.
Kuhnert, Volker; and Niedrig, Franklin, to Strapex AG. Wound body or package. 4,533,046, Cl. 206-389.000.
Kumar, Kaplesh: *See*—
Das, Dilip K.; Kumar, Kaplesh; and Wettstein, Ernest C., 4,533,407, Cl. 148-102.000.
Kumazawa, Eiji, to Kabushiki Kaisha Kogai Boshi Sogo Kenkyusho. Electrolyzed water producing apparatus. 4,533,451, Cl. 204-229.000.
Kume, Masato, to Clarion Co., Ltd. Tape player for vehicles. 4,533,966, Cl. 360-96.500.
Kummer, Rudolf; Richter, Wolfgang; Schwirten, Kurt; and Stops, Peter, to BASF Aktiengesellschaft. Continuous hydroformylation of olefinically unsaturated compounds. 4,533,757, Cl. 568-454.000.
Kumura, Haruyoshi: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,533,340, Cl. 474-28.000.
Kunack, Wilfried: *See*—
Neumann, Manfred; Morgner, Henry; Forster, Harry; Jasch, Gunter; Kunack, Wilfried; Godenschweg, Martin; and Unganz, Peter, 4,532,888, Cl. 118-718.000.
Kunig, Helmut, to S.A. Des Ateliers, Houget Duesberg Bosson. Needle bar drawing device. 4,532,678, Cl. 19-129.00R.
Kunz, Walter: *See*—
Eckhardt, Wolfgang; and Kunz, Walter, 4,533,659, Cl. 514-184.000.
Kura, Kohei: *See*—
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Kura, Kohei; Yagi, Masahiro; and Shirahase, Ichiro, 4,533,668, Cl. 514-321.000.
Kurachi, Hisao; Ito, Takeo; Iwase, Takayuki; and Shiota, Junji, to Brother Kogyo Kabushiki Kaisha. Ribbon driving mechanism for typewriter. 4,533,267, Cl. 400-214.000.
Kuramochi, Hiroshi: *See*—
Honda, Kazuhiro; and Kuramochi, Hiroshi, 4,533,604, Cl. 428-521.000.
Kurashiki Boseki Kabushiki Kaisha: *See*—
Kondo, Takashi; Sakai, Chikaaki; and Karakawa, Tadashi, 4,533,359, Cl. 8-128.00R.
Kuribayashi, Masaki: *See*—
Fujimura, Naoto; Sonobe, Akihiro; Yoshihara, Toshiyuki; Takebayashi, Norie; Tanaka, Takashi; and Kuribayashi, Masaki, 4,533,232, Cl. 355-3.00R.
Kurihara, Kozo: *See*—
Ikegami, Yoshihiko; Kurihara, Kozo; Ichikawa, Izuo; and Nakane, Hisanori, 4,533,562, Cl. 427-3.000.
Kurita, Hiroyuki; Kobayashi, Yuko; Dosaka, Shinichi; Kikuchi, Juro; Takase, Hiroshi; and Harada, Kenichi, to Olympus Optical Co., Ltd. Indicating device for indicating data within the visual field of microscope. 4,533,220, Cl. 350-507.000.
Kuroki, Hironori; Honda, Tsuguo; and Mitsui, Toshihisa, to Kuroki Kogyosho Co., Ltd. Roll for transferring hot metal pieces. 4,532,978, Cl. 164-448.000.
Kuroki Kogyosho Co., Ltd.: *See*—
Kuroki, Hironori; Honda, Tsuguo; and Mitsui, Toshihisa, 4,532,978, Cl. 164-448.000.
Kurosawa, Shigeru; and Ueshima, Takashi, to Showa Denko Kabushiki Kaisha. Chlorine containing polyether sulfone polymers and preparation thereof. 4,533,721, Cl. 528-174.000.
Kurple, Kenneth R.: *See*—
Alexander, Delores J.; Kurple, Kenneth R.; and Kordomenos, Panagiotis I., 4,533,704, Cl. 525-440.000.
Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., 4,533,703, Cl. 525-440.000.
Kurumada, Tomoyuki: *See*—
Toda, Toshimasa; and Kurumada, Tomoyuki, 4,533,688, Cl. 524-100.000.
Kusakawa, Norihisa: *See*—
Tayama, Suehiro; and Kusakawa, Norihisa, 4,533,689, Cl. 524-130.000.
Kushinsky, Ivan V.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., 4,533,243, Cl. 356-44.000.
Kuster, Hans-Werner: *See*—
Kramer, Carl; and Kuster, Hans-Werner, 4,533,571, Cl. 427-180.000.
Kusumoto, Koshi; Kawaguchi, Toshio; and Ogata, Takayuki, to Tokuyama Soda Kabushiki Kaisha. Adhesive coating material. 4,533,701, Cl. 525-370.000.
Kuwabara, Toshihiro: *See*—
Yoden, Yoshimasa; Okuda, Tsuneo; Fuchigami, Eiji; and Kuwabara, Toshihiro, 4,533,358, Cl. 8-94.200.
Kuzara, James H., to Ralston Purina Company. Animal feeding and monitoring system. 4,532,892, Cl. 119-51.00R.
Kuzma, Janusz A.: *See*—
Crosby, Peter A.; Daly, Christopher N.; Money, David K.; Patrick, James F.; Seligman, Peter M.; and Kuzma, Janusz A., 4,532,930, Cl. 128-419.00R.
KV33 Corporation: *See*—
Huffman, Ronald E., 4,533,323, Cl. 433-60.000.
Kwaan, Hau C. Fluid withdrawal and instillation device. 4,532,969, Cl. 141-27.000.
Kyriacou, Demetrios; and Brattesani, Donald N., to Dow Chemical Company, The. Electrolytic cell comprising stainless steel anode, basic aqueous electrolyte and a cathode at which tetrachloro-2-picolinate ions can be selectively reduced in high yield to 3,6-dichloropicolinate ions. 4,533,454, Cl. 204-272.000.
Kyster, Erik: *See*—
Petersen, Hans C.; Kyster, Erik: and Thomsen, Svend E., 4,533,303, Cl. 418-61.00B.
L. Schuler GmbH: *See*—
Weber, Heinz, 4,533,029, Cl. 192-18.00A.
La Gard, Inc.: *See*—
Uyeda, Tim M., 4,532,785, Cl. 70-333.00R.
Labor Muszeripari Muvek: *See*—
Muranyi, Istvan; Balazs, Laszlone ; Molnar, Jozsef; Burda, Ferencne ; Metzler, Maria; and Szerdahelyi, Lajos, 4,533,638, Cl. 435-288.000.
Lacey, Ralph W., to Dijet Industrial Co., Ltd. Cutter blade retention. 4,533,281, Cl. 407-36.000.
Lade, Robert W.: *See*—
Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., 4,533,783, Cl. 136-249.000.
Ladouceur, Harold A.: *See*—
Steward, John H.; and Ladouceur, Harold A., 4,532,664, Cl. 10-162.00A.
Laeis-Werke AG: *See*—
von Karchowski, Wilhelm, 4,533,311, Cl. 425-405.00H.
La Fiandra, Carlo: *See*—
Deschenaux, Warren; Hughes, Gregory; Kreuzer, Justin; and La Fiandra, Carlo, 4,534,047, Cl. 378-35.000.

Lagace, Arthur P.: *See*—
Cook, Edward J.; and Lagace, Arthur P., 4,533,254, Cl. 366-176.000.
Lagofun, Guy J., to L'Etat Francais. Combustible safety primer of selective percussion for case-less ammunition or ammunition with combustible case. 4,532,866, Cl. 102-204.000.
LaGuardia, Francesco. Kinematic mechanism. 4,532,828, Cl. 74-793.000.
Lahav, Meir; Addadi, Lia; and Weissbuch, Isabela, to Yeda Research and Development Company Ltd. Resolution of amino acids. 4,533,506, Cl. 260-501.120.
Lai, Ching C.: *See*—
Kellie, Truman F.; Landry, J. David; and Lai, Ching C., 4,532,723, Cl. 356-73.000.
Lake, W. H. Russell, to Trail-R-Van Inc. Lift-roof trailer. 4,533,171, Cl. 296-173.000.
Lalin, Hill S. Fluid sampler and gas flow control system and method. 4,532,814, Cl. 73-863.030.
Lama, William L.: *See*—
Hammond, Thomas J.; Lama, William L.; Northrup, Karl A.; and Corona, Stephen C., 4,533,853, Cl. 315-117.000.
Lamarche, Paul E., to Borg-Warner Corporation. Friction engaging drives with ceramic materials. 4,533,032, Cl. 192-107.00M.
Lambda Physik GmbH: *See*—
Hohla, Kristian; and Albers, Ernst, 4,534,034, Cl. 372-59.000.
Lambregts, Antonius A., to Boeing Company, The. Aircraft roll steering command system. 4,533,999, Cl. 364-429.000.
Lamy, Jean-Michel; and Jacquet, Joel, to Regie Nationale des Usines Renault. Automobile automatic transmission control device. 4,532,824, Cl. 74-475.000.
Landry, J. David: *See*—
Kellie, Truman F.; Landry, J. David; and Lai, Ching C., 4,532,723, Cl. 356-73.000.
Lang, Gunther; and Wajaroff, Theodor, to Wella AG. Process for the permanent deformation of hair. 4,532,950, Cl. 132-7.000.
Larson, Orville W.: *See*—
Krumin, Donald K.; and Larson, Orville W., 4,534,063, Cl. 455-344.000.
Larsson, Peter L.: *See*—
Pokojny, Rudolf; and Larsson, Peter L., 4,533,788, Cl. 174-88.00C.
Lashway, William H.: *See*—
Boyd, Dana M.; Colombo, Edward A.; and Lashway, William H., 4,533,578, Cl. 428-35.000.
Lasker, Sigmund E. Antithrombotic agent. 4,533,549, Cl. 514-56.000.
Lasky, Jerome B.: *See*—
Kinney, Wayne I.; Lasky, Jerome B.; and Nesbit, Larry A., 4,532,700, Cl. 29-576.00W.
Latimer, Stanley M.: *See*—
Conly, Ralph A.; and Latimer, Stanley M., 4,533,967, Cl. 360-123.000.
Latone, Thomas L., to Knoll International, Inc. Reclining chair. 4,533,177, Cl. 297-301.000.
Lau, Yue-Ying; Chu, Kwo R.; Granatstein, Victor L.; and Barnett, Larry R. Wide-band gyrotron traveling-wave amplifier. 4,533,875, Cl. 330-4.000.
Laugal, James A.: *See*—
Benkeser, Robert A.; Laugal, James A.; and Rappa, Angela, 4,533,752, Cl. 564-428.000.
Benkeser, Robert A.; Laugal, James A.; and Rappa, Angela, 4,533,760, Cl. 568-667.000.
Lauvray, Georges R. P. L.; and Darche, Michel J. P., to Societe ECA. Process and arrangement for aerial observation and/or communication for a submerged submarine. 4,533,945, Cl. 358-109.000.
Lawrence, Dale M.: *See*—
Auth, David C.; Opie, Eric A.; and Lawrence, Dale M., 4,532,924, Cl. 128-303.170.
Lear S.n.c.: *See*—
Foggini, Giovanni, 4,533,275, Cl. 403-165.000.
Lechtenberg, Thomas, to United States of America, Energy. Minimum activation martensitic alloys for surface disposal after exposure to neutron flux. 4,533,406, Cl. 148-37.000.
Lederis, Karl P.; MacCannell, Keith L.; and Ichikawa, Tomoyuki, to Salk Institute For Biological Studies, The. Urotensin peptides. 4,533,654, Cl. 514-12.000.
Lederle, Franz, to Gebr. Bode & Co. Anticatching device for automatic doors or windows. 4,533,901, Cl. 340-52.00R.
Lederle (Japan), Ltd.: *See*—
Kishi, Ikuo; and Yoshida, Hideo, 4,533,546, Cl. 424-81.000.
Leding, Kenneth J., to Leding Loader, Inc. Maxi-ball lubricator and dispenser for muzzle loading firearms. 4,533,019, Cl. 184-14.000.
Leding Loader, Inc.: *See*—
Leding, Kenneth J., 4,533,019, Cl. 184-14.000.
Lee, Frank W. C.; and Baron, Kenneth S., to Hexcel Corporation. Single package epoxy resin system. 4,533,715, Cl. 528-45.000.
Lee, Min-Hsiun, to Standard Oil Company. Sulfur recovery process. 4,533,529, Cl. 423-230.000.
Le Faou, Daniel: *See*—
Bernard, Jean; Beyl, Jean J. A.; Campillo, Christian; and Le Faou, Daniel, 4,533,154, Cl. 280-615.000.
Legge, Michael H.: *See*—
Neelameggham, Ramaswami; Abedi, Hedayat; Priscu, John C.; and Legge, Michael H., 4,533,572, Cl. 427-216.000.
Leibrock, Kurt; and Killich, Hans-Jurgen, to Saarbergwerke Aktiengesellschaft. Device for gripping and raising tamping tools or for holding raised tamping tools in a tamping machine which is especially used for the packing of coking coal. 4,533,002, Cl. 173-53.000.
Leiby, Robert W.: *See*—
Baker, Alan J.; and Leiby, Robert W., 4,533,902, Cl. 340-347.00P.
Leigh, Arthur G.: *See*—
Davies, James F.; Leigh, Arthur G.; and Rennie, George K., 4,532,719, Cl. 34-12.000.
Leimkuhler, Jurgen, to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen GmbH & Co. Kommanditgesellschaft. Apparatus for the desulfurization of flue gases. 4,533,522, Cl. 422-170.000.
Leipnitz, Michael. Phonograph pick-up with improved shield grounding. 4,534,022, Cl. 369-170.000.
Leivenzon, Simon; and Leivenzon, Steven, to Firmagroup Australia Pty. Ltd. Indicating means for a door operator device. 4,533,905, Cl. 340-524.000.
Leivenzon, Steven: *See*—
Leivenzon, Simon; and Leivenzon, Steven, 4,533,905, Cl. 340-524.000.
Leland Stanford Junior University, Board of Trustees of the: *See*—
Sherby, Oleg D.; and Oyama, Toshimasa, 4,533,390, Cl. 75-126.00Q.
Leo, Heinz: *See*—
Klein, Werner; and Leo, Heinz, 4,533,078, Cl. 228-45.000.
Leonard, George E., to Kartridg Pak Co., The. Rotary filling apparatus and method. 4,532,968, Cl. 141-5.000.
Le Page, Jean-Francois: *See*—
Courty, Philippe; Roussel, Michel; Leporq, Serge; Le Page, Jean-Francois; and Varin, Philippe, 4,533,650, Cl. 502-84.000.
Leporq, Serge: *See*—
Courty, Philippe; Roussel, Michel; Leporq, Serge; Le Page, Jean-Francois; and Varin, Philippe, 4,533,650, Cl. 502-84.000.
Lerch, Hansueli, to Gebruder Sulzer Aktiengesellschaft. Method of operating an air nozzle weaving machine. 4,532,964, Cl. 139-435.000.
Lerry, Michel; and Keinborg, Maurice, to Aluminium Pechiney. Electrolysis tank, for the production of aluminum, having a floating conductive screen. 4,533,452, Cl. 204-243.00R.
L'Etat Francais: *See*—
Lagofun, Guy J., 4,532,866, Cl. 102-204.000.
Leumann, Hans E.; Gerkey, Kenneth S.; and Wylie, Mark E., to Westinghouse Electric Corp. High precision electronic digital measurement system wound on constant-torque-controlled drum. 4,532,709, Cl. 33-140.000.
Leutgob, Alois: *See*—
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,533,385, Cl. 75-10.00R.
Levallois, Emile: *See*—
Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, 4,533,526, Cl. 423-1.000.
LeVeen, Eric G.; and LeVeen, Robert F. Automatic urine flow meter. 4,532,936, Cl. 128-762.000.
LeVeen, Robert F.: *See*—
LeVeen, Eric G.; and LeVeen, Robert F., 4,532,936, Cl. 128-762.000.
Levenstein, Harold, to Perkin-Elmer Corporation, The. Rapid surface figuring by selective deposition. 4,533,449, Cl. 204-192.00R.
Lever Brothers Company: *See*—
Davies, James F.; Leigh, Arthur G.; and Rennie, George K., 4,532,719, Cl. 34-12.000.
Sen Gupta, Achintya K., 4,533,501, Cl. 260-428.000.
Levinson, Samuel, to United Technologies Corporation. Adjustable double balanced mixer. 4,534,062, Cl. 455-330.000.
Lewis, Charles, Jr.; Olander, Jitka V.; and Tolbert, William R., to Monsanto Company. Method of isolating monoclonal antibodies from hybridoma cultures. 4,533,496, Cl. 260-112.00R.
Leygraf, Christofer H.: *See*—
Somorjai, Gabor A.; and Leygraf, Christofer H., 4,533,608, Cl. 429-111.000.
Lhuillier, Francois: *See*—
Bastion, Patrick; Lhuillier, Francois; and Mutschler, Ulrich, 4,532,963, Cl. 139-59.000.
Li, Thomas M.: *See*—
Benovic, Jeffrey L.; Buckler, Robert T.; Burd, John F.; and Li, Thomas M., 4,533,493, Cl. 260-112.00B.
Libert, Harold C., to Maul Technology Corporation. Neck ring mechanism for I.S. glass forming machine. 4,533,377, Cl. 65-232.000.
Lickei, Donald L.: *See*—
O'Connor, James M.; Lickei, Donald L.; Rosin, Michael L.; and Donze, Richard J., 4,533,717, Cl. 528-78.000.
Liebman, Bradley B. Liquid absorbing playing piece. 4,533,145, Cl. 273-378.000.
Liede, Dieter: *See*—
Buchner, Norbert; Eberspacher, Rolf; and Liede, Dieter, 4,533,063, Cl. 220-270.000.
Lieder, Bernhard: *See*—
Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, 4,533,755, Cl. 568-454.000.
Liepmann, Hans: *See*—
Zeugner, Horst; Roemer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, 4,533,662, Cl. 514-221.000.
Liet, Cornelis H., to Multinorm B.V. Device for forming a compressed produce bale. 4,532,758, Cl. 56-341.000.
Lim, Sim K.: *See*—
Goodman, Richard M.; and Lim, Sim K., 4,533,465, Cl. 209-167.000.

Lin, Jiang-Jen; and Knifton, John F., to Texaco Inc. Preparation of 2-hydroxytetrahydrofuran by hydroformylation of allyl alcohol using ketone solvents. 4,533,742, Cl. 549-475.000.

Lin, Jiang-Jen; and Brader, Walter H., Jr., to Texaco Inc. Process for synthesis of acrylic acid precursors via hydroformylation of vinyl ether. 4,533,756, Cl. 568-454.000.

Linatex Corporation of America: *See*—
Smith, Michael J.; and Soucie, Allen L., 4,533,464, Cl. 209-158.000.

Lincke, Paul, to Sulzer Brothers Limited. Weft yarn picking channel. 4,532,965, Cl. 139-435.000.

Lindahl, Anthony T.: *See*—
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,532,974, Cl. 164-132.000.

Lindahl, LeMoyne. Sealing ring assembly for use in pulp refining equipment. 4,533,148, Cl. 277-53.000.

Linde Aktiengesellschaft: *See*—
Butz, Peter; Ranke, Gerhard; and Tvan, Tran A., 4,533,373, Cl. 62-17.000.

Lindlar, Wilhelm; and Wermeister, Gunter, to Santrade Limited. Milling cutter. 4,533,282, Cl. 407-38.000.

Lisa, Rudolph E.: *See*—
Schmidt, Douglass N.; Finnan, Jeffrey L.; and Lisa, Rudolph E., 4,533,674, Cl. 514-474.000.

Lissau, Frederic, to Sloan Valve Company. Gladhand with dirt protection plug. 4,533,115, Cl. 251-142.000.

Litchfield, Peter A. Safety device and harness for use in same. 4,533,017, Cl. 182-3.000.

Litke, Alan E., to Loctite Corporation. Thixotropic cyanoacrylate compositions. 4,533,422, Cl. 156-307.300.

Litman, David J.; and Ullman, Edwin F., to Syva Company. Simultaneous calibration heterogeneous immunoassay. 4,533,629, Cl. 435-7.000.

Littelfuse, Inc.: *See*—
Kowalik, Joseph W.; and Krueger, David J., 4,533,895, Cl. 337-165.000.
Olson, Harry W.; and Olson, Phillip A., 4,533,897, Cl. 337-408.000.

Liverance, Howard G.; and Wood, Jack E. Winch assembly. 4,533,119, Cl. 254-344.000.

Livesey, Declan B.: *See*—
Toma, Petre; Redford, David A.; Livesey, Declan B.; and Coates, Roy M., 4,532,994, Cl. 166-303.000.

LKB-Produkter AB: *See*—
Soderkvist, Anton, 4,532,838, Cl. 83-13.000.

Lockwood, George S.; and Phillips, John H., to Monterey Abalone Farms. Process for controlling the microbial environment in abalone mariculture. 4,532,883, Cl. 119-4.000.

Loctite Corporation: *See*—
Litke, Alan E., 4,533,422, Cl. 156-307.300.

Loctite (Ireland) Ltd : *See*—
Conway, Paul; Melody, David P.; Woods, John; Casey, J. Eisirt; Bolger, Bernard J.; and Martin, Francis R., 4,533,446, Cl. 204-159.240.

Logic Controls Corp.: *See*—
Norwood, William L., 4,532,952, Cl. 137-240.000.

Long, William H., to Northrop Corporation. Tandem electric discharges for exciting lasers. 4,534,035, Cl. 372-85.000.

Longmore, Val L.: *See*—
Knight, Reed H.; and Longmore, Val L., 4,533,091, Cl. 242-129.600.

Loper, Bernd: *See*—
Muller, Alf; Schobbe, Hermann; Loper, Bernd; and Binnewies, Hartmut, 4,533,184, Cl. 301-63.00R.

L'Oreal: *See*—
Sebag, Henri, 4,533,545, Cl. 424-70.000.
Sebag, Henri; and Zysman, Alexandre, 4,533,714, Cl. 528-27.000.

Lorenz, Manfred, to Kapp & Co. Werkzeugmaschinenfabrik. Method and device for fine profiling tools coated with super-hard materials. 4,533,812, Cl. 219-121.0LH.

Lorenzo Barroso, Angel. Equipment for knotting automatically the openings of flexible containers. 4,533,164, Cl. 289-2.000.

Lorke, Horst: *See*—
Cargnino, Francesco; Natoli, Giuseppe; and Lorke, Horst, 4,533,479, Cl. 252-34.000.

Lorts, Anthony. Internal combustion engine fuel-injection system. 4,532,899, Cl. 123-292.000.

Losell, Ingvar E.: *See*—
Johnsson, Bo A.; Losell, Ingvar E.; and Palmqvist, Sune H., 4,533,516, Cl. 422-46.000.

Losio, Gastone, to Clevite S.r.l. Flanged half-bearing for motor applications. 4,533,261, Cl. 384-296.000.

Louw, Hendrik A.: *See*—
Davis, Bender A.; and Louw, Hendrik A., 4,533,173, Cl. 296-216.000.

Louw, John A., to Fertility & Genetics Associates. Uterine catheter. 4,533,345, Cl. 604-43.000.

Love, Franklin S., III, to Milliken Research Corporation. Inspection lighting system. 4,533,245, Cl. 356-238.000.

Lu, Wei C., to Eastman Kodak Company. Magnetic brush developer apparatus. 4,533,229, Cl. 355-3.0DD.

Lubrizol Corporation, The: *See*—
Jahnke, Richard W., 4,533,481, Cl. 252-49.600.

Lucas Industries: *See*—
Rath, Heinrich B., 4,533,024, Cl. 188-79.50B.

Luccarelli, Domenick, Jr.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,533,746, Cl. 560-144.000.

Lucchi, George A.; and Alisobhani, Jalal, to Sperry Corporation. Radar terrain signal suppressor. 4,533,915, Cl. 343-5.00W.

Ludington, Charlotte E.: *See*—
Pellegrini, Paul W.; Ludington, Charlotte E.; Golubovic, Aleksandar; and Weeks, Melanie M., 4,533,933, Cl. 357-15.000.

Ludman, Jacques E.: *See*—
Miceli, William J.; and Ludman, Jacques E., 4,533,829, Cl. 250-227.000.

Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, to Voest-Alpine Aktiengesellschaft. Method for producing metals, such as molten pig iron, steel pre-material and ferroalloys. 4,533,385, Cl. 75-10.00R.

Luhn, Dennis A.; and Schultz, Mark H., to McGraw-Edison Company. Voltage regulator. 4,533,863, Cl. 322-28.000.

Luz, David W.: *See*—
Willis, Donald H.; and Luz, David W., 4,533,855, Cl. 315-370.000.

Lydtin, Hans: *See*—
Frank, Berthold; Gartner, Georg; and Lydtin, Hans, 4,533,852, Cl. 313-346.0DC.

Lyerly, David M.: *See*—
Wilkins, Tracy D.; and Lyerly, David M., 4,533,630, Cl. 435-7.000.

Lyston, Edgar L., to American Pulverizer Company. Frozen coal cracker. 4,533,088, Cl. 241-186.300.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Galster, Hans-Peter, 4,533,134, Cl. 271-240.000.
Heller, Albert; Birkmair, Hubert; and Grauberger, Hermann, 4,532,864, Cl. 101-219.000.

M. S. Willett, Inc.: *See*—
Gerben, Ralph D.; and Walters, Harry J., 4,532,820, Cl. 74-56.000.

Maag Gear-Wheel & Machine Co., Ltd.: *See*—
Rhyner, Hans-Ulrich, 4,534,007, Cl. 364-560.000.
Sterki, Armin, 4,532,715, Cl. 33-179.50R.

Maas, Renata, to New York University. Colony hybridization method. 4,533,628, Cl. 435-6.000.

MacCannell, Keith L.: *See*—
Lederis, Karl P.; MacCannell, Keith L.; and Ichikawa, Tomoyuki, 4,533,654, Cl. 514-12.000.

Mackay, Donald A. M.: *See*—
Morris, William M.; Witzel, Frank; Puglia, Wayne J.; Mackay, Donald A. M.; Clark, K. Warren; and Patanasinth, Kanit J., 4,533,543, Cl. 424-38.000.

MacLeod, Robert B., Jr.: *See*—
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MADAG Maschinen- und Apparatebau Dietikon AG: *See*—
Rosenberg, Stephan, 4,533,163, Cl. 289-1.500.

Maeda, Narimichi: *See*—
Kobayashi, Masahito; Maeda, Narimichi; Hagiwara, Yoshimune; Akazawa, Takashi; and Sugiyama, Shizuo, 4,534,010, Cl. 364-748.000.

Maeda, Takayoshi: *See*—
Tomofuji, Yoshiaki; and Maeda, Takayoshi, 4,533,987, Cl. 363-36.000.

Maeda, Tetsuro; Okamoto, Akihiro; Shimizu, Yoshimitsu; and Nomoto, Takashi, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition. 4,533,698, Cl. 525-73.000.

Maehara, Naoyoshi; Hashido, Kenkichi; and Hirata, Hiroshi, to Matsushita Electric Industrial Company, Limited. Piezoelectric oscillated nozzle. 4,533,082, Cl. 239-102.000.

Maekawa, Toshikazu: *See*—
Soneda, Mitsuo; and Maekawa, Toshikazu, 4,533,954, Cl. 358-212.000.

Maffia, Gennaro J., to Atlantic Richfield Company. Natural gas conversion. 4,533,780, Cl. 585-330.000.

Magar, Surendar S.; and Caudel, Edward R., to Texas Instruments Incorporated. Microcomputer having shifter in ALU input. 4,533,992, Cl. 364-200.000.

Magnetic Separation Systems, Inc.: *See*—
Kenny, Garry R.; Sommer, Edward J., Jr.; and Roos, Charles E., 4,533,053, Cl. 209-636.000.
Sommer, Edward J., Jr.; Kenny, Garry R.; and Roos, Charles E., 4,533,054, Cl. 209-687.000.

Maher, Galeb H., to Sprague Electric Company. Low-firing high Q monolithic ceramic capacitor. 4,533,974, Cl. 361-320.000.

Maille , Jacques: *See*—
Bourdillot, Michel; Gauthier, Andre ; Maille , Jacques; and Pitault, Bernard, 4,532,699, Cl. 29-572.000.

Mailliet, Pierre; Andonov, Radomir; Stomp, Hubert; and Monai, Jean, to Paul Wurth S.A. Apparatus for guiding and changing immersion lances. 4,533,125, Cl. 266-226.000.

Maisel, Douglas A. Signaling system for FM transmission systems. 4,534,054, Cl. 381-4.000.

Maitland, Robert L. Combination carrier, chair, and lounge/table. 4,533,151, Cl. 280-47.250.

Makimaa, Tapani, to Kemppi Oy. Method for measuring the free wire length in MIG/MAG welding. 4,533,817, Cl. 219-137.710.

Makinen, Seppo, to Oy Wartsila Ab. Method for producing model ice. 4,532,772, Cl. 62-74.000.

Makino, Naonori: *See*—
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,533,613, Cl. 430-78.000.

Maldonado, Reynaldo L.; and Rosanoff, Kenneth A., to AMF Inc. Tissue culture medium. 4,533,634, Cl. 435-240.000.

Malkin, Shmuel: *See*—
Cahen, David; Malkin, Shmuel; Horwitz, Benjamin; and Bults, Gerard, 4,533,252, Cl. 356-432.000.

Mally, Timothy G.; Rattmann, James A.; and Borsuk, Alvin, to Oscar Mayer Foods Corp. Automatic sheet product line. 4,532,751, Cl. 53-396.000.

Malmquist, Jerome A.; and Reidt, Dean K., to Minnesota Mining and Manufacturing Company. Electrical connector locator plate. 4,533,129, Cl. 269-207.000.

Malone, Dennis M., to Combustion Engineering, Inc. Submerged scraper conveyor automatic speed control. 4,533,856, Cl. 318-6.000.

Malone, Harold H. General journal form. 4,533,160, Cl. 282-23.00R.

Mandai, Harufumi; Iwai, Kiyoshi; and Naito, Yasuyuki, to Murata Manufacturing Co., Ltd. Reduction reoxidation type semiconductor ceramic condenser. 4,533,931, Cl. 357-10.000.

Manghisi, Elso; and Cascio, Giuseppe, to Istituto Luso Farmaco D'Italia s.p.a. Process for the optical resolution of the dl-α-hydroxy-3-(4-methoxyphenyl)-3-(2-aminophenylthio)propionic acid. 4,533,748, Cl. 562-401.000.

Manning, Peter: *See*—
Dixon, John; and Manning, Peter, 4,533,336, Cl. 446-465.000.

Manufacture de Machines du Haut-Rhin: *See*—
Richard, Jacques R., 4,533,038, Cl. 198-646.000.

Manzione, Louis T., to AT&T Bell Laboratories. Optimized reaction injection molding. 4,534,003, Cl. 364-476.000.

Marez, John: *See*—
Trias, John A.; and Marez, John, 4,533,215, Cl. 350-347.00E.

Marhold, Albrecht; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for the preparation of aromatic trifluoromethyl compounds. 4,533,777, Cl. 570-144.000.

Marinelli, Nicola, to NCR Corporation. Carbonless paper coating formulation. 4,533,567, Cl. 427-150.000.

Mark, Harold W.: *See*—
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,533,467, Cl. 209-167.000.

Mark, Hermann, to Isovolta Osterreichische Isolierstoffwerke. Production of synthetic fibers. 4,533,511, Cl. 264-184.000.

Markus, Franklyn M.: *See*—
Nichols, James; and Markus, Franklyn M., 4,533,179, Cl. 297-440.000.

Marler Haley Exposystems Ltd.: *See*—
Bannister, Brian C., 4,533,122, Cl. 256-69.000.

Marley Tile A.G.: *See*—
Cooper, Christopher A., 4,532,739, Cl. 52-57.000.

Marsicek, Zdenek; Janeba, Jaroslav; Pacha, Antonin; Pastrnak, Ales; Dykast, Jaroslav; and Prazak, Roman, to Vyzkumny Ustav Bavlnarsky. Method of and apparatus for the continuous monitoring and analysis of the operation of spinning units in an open-end spinning machine. 4,534,042, Cl. 377-16.000.

Martel, Rene , to American Home Products Corporation. Method of treating arthritis with etodolac. 4,533,551, Cl. 514-411.000.

Martens, George D.; Smith, Alexander B.; and Healy, Thomas D., to Automation Industries, Inc. Dual transducer connection by a single cable. 4,532,796, Cl. 73-632.000.

Martin, Francis R.: *See*—
Conway, Paul; Melody, David P.; Woods, John; Casey, J. Eisirt; Bolger, Bernard J.; and Martin, Francis R., 4,533,446, Cl. 204-159.240.

Martin Marietta Corporation: *See*—
Tobey, William H.; Thomas, Donald A.; and Gardner, William J., 4,532,674, Cl. 16-295.000.
Tutle, Edward G., 4,532,757, Cl. 56-328.00R.

Martinez, Kenneth; and Betts, William L., to Paradyne Corporation. Normalized error compensator for modems using radial amplitude modulation for multiplexing. 4,534,026, Cl. 370-100.000.

Martinez, Kenneth: *See*—
Betts, William L.; and Martinez, Kenneth, 4,534,036, Cl. 375-10.000.

Maru Kikai Kogyo Co., Ltd.: *See*—
Hongo, Toshio, 4,532,792, Cl. 72-319.000.

Maruyama, Hiromi; Sasaoka, Seiji; Kiuchi, Mitsuo; and Kanehara, Hironori, to Nippon Soda Co. Ltd. Feed additives for ruminants. 4,533,557, Cl. 426-61.000.

Marwitz, Heinrich: *See*—
Preiner, Gerhard; Huhn, Karl; Muller, Johann; Marwitz, Heinrich; and Ullrich, Kurt, 4,533,477, Cl. 252-8.900.

Massachusetts Institute of Technology: *See*—
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,533,443, Cl. 204-84.000.

Masters, Anthony F.; and Cavell, Kingsley J., to Commonwealth Scientific and Industrial Research Organization. Catalysts for olefin oligomerization and isomerization. 4,533,651, Cl. 502-117.000.

Masuhara, Hideki; Katada, Kunio; and Kudo, Uichi, to Hitachi, Ltd. Split structure type transformer. 4,533,892, Cl. 336-147.000.

Masunaga, Makoto; and Taka, Hideo, to Canon Kabushiki Kaisha. Distance measuring device and automatic focusing system using same. 4,533,241, Cl. 356-1.000.

Material Control, Inc.: *See*—
Kerr, James F., 4,533,037, Cl. 198-499.000.
Reiter, Robert C., 4,533,035, Cl. 198-499.000.

Mathews, Clive A.; and Gillies, George M., to British Nuclear Fuels Limited. Method of and apparatus for monitoring a rotary kiln assembly. 4,533,319, Cl. 432-3.000.

Matsuda, Kenji: *See*—
Sato, Akihiro; Kikuta, Kazutsune; Uwai, Toshihiro; Matsuda, Kenji; and Hattori, Nobutaka, 4,533,705, Cl. 526-114.000.

Matsui, Hiroshi: *See*—
Nakahara, Kichio; Matsui, Hiroshi; and Yoshiyama, Harumichi, 4,532,896, Cl. 123-193.00H.

Matsumoto, Ken; and Ward, John S., to Eli Lilly and Company. 6-Phenyl-2,3-bis-(4-methoxyphenyl)-pyridine derivatives having anti-inflammatory activity. 4,533,666, Cl. 514-277.000.

Matsumura, Hiroshi; Otani, Masato; and Murakami, Fumiki, to Mitsubishi Rayon Co. Ltd. Process for isolating methacrylic acid by extraction. 4,533,750, Cl. 562-600.000.

Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Kura, Kohei; Yagi, Masahiro; and Shirahase, Ichiro, to Nippon Shinyaku Co. Ltd. Antihyperglycemic moranoline derivatives. 4,533,668, Cl. 514-321.000.

Matsuno, Mitsuo; Kudoh, Michio; and Imai, Hiroshuke, to Nippon Oil Company, Ltd. Process for preparing 4-methyl-1-pentene. 4,533,781, Cl. 585-516.000.

Matsuo, Shohta: *See*—
Nakamura, Yoichi; Watarai, Shumei; and Matsuo, Shohta, 4,533,602, Cl. 428-447.000.

Matsushita Electric Industrial Company, Limited: *See*—
Maehara, Naoyoshi; Hashido, Kenkichi; and Hirata, Hiroshi, 4,533,082, Cl. 239-102.000.
Ogura, Mototsugu; Ban, Yuzaburoh; and Hase, Nobuyasu, 4,533,410, Cl. 148-175.000.

Matsushita Electric Works, Ltd.: *See*—
Nakamura, Yoshimitsu, 4,533,848, Cl. 310-237.000.
Tomofuji, Yoshiaki; and Maeda, Takayoshi, 4,533,987, Cl. 363-36.000.

Matsuura, Akira: *See*—
Watai, Yuji; Yasui, Hirokazu; Hirayama, Yoshiyuki; and Matsuura, Akira, 4,533,234, Cl. 355-14.00D.

Matsuura, Tamizo: *See*—
Hanaoka, Yuzuru; Murayama, Takeshi; Muramoto, Setsuo; and Matsuura, Tamizo, 4,533,518, Cl. 422-70.000.

Matsuyama, Kazuo: *See*—
Komai, Takeshi; Matsuyama, Kazuo; and Saigo, Takuya, 4,533,699, Cl. 525-277.000.

Mattei, Frank V.; and Regula, Donald W., to Ethicon, Inc. Dry coating of surgical filaments. 4,532,929, Cl. 128-335.500.

Matthews, Donald P.: *See*—
Wagner, Eugene R.; Barney, Charlotte L.; and Matthews, Donald P., 4,533,677, Cl. 514-638.000.

Mauderer, Ernst. Stamping and bending machine for manufacturing shaped parts. 4,532,794, Cl. 72-442.000.

Maul Technology Corporation: *See*—
Libert, Harold C., 4,533,377, Cl. 65-232.000.

Maurice, Thomas A. Double lock lock box. 4,532,783, Cl. 70-63.000.

Mauser-Werke Oberndorf GmbH: *See*—
Gleichaut, Winfried; Gunther, Oswin; Hoffmann, Dietrich; and Funke, Rolf, 4,532,868, Cl. 102-527.000.

Maxemchuk, Nicholas F.; and Netravali, Arun N., to AT&T Bell Laboratories. System and method for controlling a multiple access data communications system including both data packets and voice packets being communicated over a cable television system. 4,534,024, Cl. 370-85.000.

May, Jerome E.: *See*—
Rees, James D.; Gundlach, Robert W.; and May, Jerome E., 4,533,979, Cl. 362-97.000.

May, Michael G. Thermal insulating mat. 4,533,583, Cl. 428-69.000.

Mayer, Wildman Industries, Inc.: *See*—
Tilson, Alan L.; Quay, Earl R.; and Knight, John C., 4,532,780, Cl. 66-9.00B.

Mayernick, Richard: *See*—
Teng, Yu-Ling; McCoy, Charles; DeFalco, Francis; and Mayernick, Richard, 4,533,606, Cl. 428-658.000.

Mazda Motor Corporation: *See*—
Otani, Toshiaki; Chihara, Takeshi; and Nishikori, Tsutomu, 4,533,027, Cl. 192-8.00C.
Yokooku, Katsuhiko; Kaneko, Tadashi; and Nakazumi, Tadataka, 4,532,905, Cl. 123-443.000.

McAlexander, Joseph C., III; White, Lionel S., Jr.; and Mohan Rao, G. R., to Texas Instruments Incorporated. High performance dynamic sense amplifier with voltage boost for row address lines. 4,533,843, Cl. 307-530.000.

McBride, Lyle E.: *See*—
Grenier, Aime J.; and McBride, Lyle E., 4,533,888, Cl. 335-131.000.

McCandless, Doyle W.: *See*—
Harder, John O.; McCandless, Doyle W.; and Peterson, Michael W., 4,532,689, Cl. 29-426.500.

McCann, William F.: *See*—
Corsover, William L.; Hoffman, Kenneth P.; McCann, William F.; and Wooden, Billy J., 4,533,278, Cl. 404-65.000.

McCanny, John V.; and McWhirter, John G., to National Research Development Corp. Multiple processing cell digital data processor. 4,533,993, Cl. 364-200.000.

McClinton, John L.; and Russell, Alexander H., to Burns & Russell Company, The. Method of preparing a patterned mold surface. 4,533,568, Cl. 427-135.000.

McClure, Carroll D.: *See*—
Wiggins, Ralphe; Kenny, George S.; and McClure, Carroll D., 4,534,019, Cl. 367-75.000.

McClure, David E., to Merck & Co., inc. Amino ketones and their preparation. 4,533,745, Cl. 560-28.000.

McCombs, Daniel G.: *See*—
Willer, David A.; Rosbak, John; and McCombs, Daniel G., 4,533,108, Cl. 248-467.000.

McCormack, Ray G., to United States of America, Army. Optical fire detection system responsive to spectral content and flicker frequency. 4,533,834, Cl. 250-554.000.

McCormick & Company, Incorporated: *See*—
Rowell, Lorne A., 4,533,559, Cl. 426-499.000.
McCoy, Charles: *See*—
Teng, Yu-Ling; McCoy, Charles; DeFalco, Francis; and Mayernick, Richard, 4,533,606, Cl. 428-658.000.
McDaniel, Francina E. Permanent wave or hair curling rod and associated hair curl display device. 4,533,328, Cl. 434-94.000.
McDavid, William D.: *See*—
Welander, Ulf E. S.; McDavid, William D.; and Morris, Charles R., 4,534,048, Cl. 378-39.000.
McDougall, Douglas J.: *See*—
Miller, Alexander; Sweetman, James E.; and McDougall, Douglas J., 4,532,743, Cl. 52-207.000.
McElroy, Arthur H., to McElroy Manufacturing, Inc. Pipe fusion apparatus with load cell for attaching side wall fittings. 4,533,424, Cl. 156-378.000.
McElroy Manufacturing, Inc.: *See*—
McElroy, Arthur H., 4,533,424, Cl. 156-378.000.
McFarlane, Arthur M. G. Tiltable edger saw mechanism. 4,532,842, Cl. 83-404.100.
McGahan, Wallace A.: *See*—
Hartshorn, Kevin; and McGahan, Wallace A., 4,532,959, Cl. 137-516.130.
McGee, Kevin J., to United States of America, Navy. Pipelined FFT processor. 4,534,009, Cl. 364-726.000.
McGraw-Edison Company: *See*—
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Yatchum, Joseph W.; and Giegel, David F., 4,533,798, Cl. 200-11.00R.
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Meissner, Konrad E., to Atlas Pacific Engineering Company. High speed vacuum syruper. 4,532,971, Cl. 141-142.000.
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Miceli, William J.; and Ludman, Jacques E., to United States of America, Air Force. Optical electromagnetic radiation detector. 4,533,829, Cl. 250-227.000.
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Evans, Jack L.; Campbell, Karen J.; Kreil, Curtis L.; and Sidney, LuAnn, 4,533,566, Cl. 427-44.000.
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Sugihara, Masahiro; Morishita, Etsuo; Hirai, Tetsuo; and Sekiya, Shin, 4,533,292, Cl. 415-2.00R.
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Neumann, Manfred; Morgner, Henry; Forster, Harry; Jasch, Gunter; Kunack, Wilfried; Godenschweg, Martin; and Unganz, Peter, 4,532,888, Cl. 118-718.000.

Mori, Nobuyuki: *See*—
Hayakawa, Kizo; Mori, Nobuyuki; Watanabe, Yoshio; and Nakashima, Kazumi, 4,532,898, Cl. 123-276.000.

Morimoto, Kiyoshi: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Yamamoto, Kiyonori; Watashi, Masahiro; Yoshinaga, Shinsuke; and Yamamoto, Toshihiko, 4,533,233, Cl. 355-8.000.

Morimoto, Takeshi: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,533,453, Cl. 204-252.000.

Morishita, Etsuo: *See*—
Sugihara, Masahiro; Morishita, Etsuo; Hirai, Tetsuo; and Sekiya, Shin, 4,533,292, Cl. 415-2.00R.

Morishita, Masakazu: *See*—
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Morishita, Masakazu, 4,534,033, Cl. 372-50.000.

Morita, Akira: *See*—
Oda, Kazutaka; Ohba, Hisao; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,533,444, Cl. 204-129.430.

Moriuchi, Shigenori: *See*—
Urata, Yukihide; Moriuchi, Shigenori; Nakamura, Taku; and Ogawa, Masashi, 4,533,623, Cl. 430-309.000.

Moriwaki, Hisayoshi: *See*—
Nakano, Kenji; Takahashi, Takao; Moriwaki, Hisayoshi; and Shimada, Keiichiro, 4,533,963, Cl. 360-19.100.

Morris, Charles R.: *See*—
Welander, Ulf E. S.; McDavid, William D.; and Morris, Charles R., 4,534,048, Cl. 378-39.000.

Morris Rod Weeder Co. Ltd.: *See*—
Nicholls, Douglas C., 4,532,790, Cl. 172-266.000.

Morris, Wilford V., to Strata Bit Corporation. Adjustable nozzle. 4,533,005, Cl. 175-393.000.

Morris, William M.; Witzel, Frank; Puglia, Wayne J.; Mackay, Donald A. M.; Clark, K. Warren; and Patanasinth, Kanit J., to Nabisco Brands, Inc. Soft homogeneous antacid tablet. 4,533,543, Cl. 424-38.000.

Morz, Gunter; and Speldrich, Werner, to ANT Nachrichtentechnik GmbH. Rotary waveguide coupling having arcuate shaped deflecting elements with 2-D blocking structures. 4,533,887, Cl. 333-256.000.

Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., to Eagle Machinery Company. Combination weighing system with span adjustment device. 4,533,007, Cl. 177-50.000.

Mosher, Oren G.: *See*—
Mosher, Oren A.; Mosher, Oren G.; and Douglas, Ellwood S., 4,533,007, Cl. 177-50.000.

Moss, Herbert I., to RCA Corporation. Method for lapping diamond. 4,532,737, Cl. 51-283.00R.

Moss, James R., to Centronics Data Computer Corp. Print hammer bank. 4,532,862, Cl. 101-93.320.

Mostmans, Joseph H.: *See*—
Heeres, Jan; and Mostmans, Joseph H., 4,533,550, Cl. 514-256.000.

Motomura, Minoru: *See*—
Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Tadanobu; and Aizawa, Tatsuo, 4,533,618, Cl. 430-126.000.

Motorola, Inc.: *See*—
Brown, Leland T., 4,533,970, Cl. 361-58.000.
Bynum, Byron G.; and Cave, David L., 4,533,845, Cl. 307-540.000.
Higgins, Robert J., Jr., 4,533,885, Cl. 333-191.000.
Krumin, Donald K.; and Larson, Orville W., 4,534,063, Cl. 455-344.000.
Miller, Ira; and Davies, Robert B., 4,533,844, Cl. 307-530.000.
Miniet, Jay J., 4,533,188, Cl. 339-17.0CF.
Segerson, Eugene E.; and Thomas, Floyd L., 4,533,209, Cl. 350-96.200.

Moulthrop, Lawrence C.: *See*—
Balko, Edward N.; and Moulthrop, Lawrence C., 4,533,455, Cl. 204-279.000.

Moustakas, Theodore D., to Exxon Research and Engineering Co. Control of the hydrogen bonding in reactively sputtered amorphous silicon. 4,533,450, Cl. 204-192.00S.

Moynagh, Eugene E., Jr.; and Jansky, Donald J., to Minnesota Mining and Manufacturing Company. Resilient circuit board contact. 4,533,204, Cl. 339-221.00R.

Mueller, Dale E.; and Snider, Joel M., to Whirlpool Corporation. Three piece snubber for automatic washer. 4,533,126, Cl. 267-141.000.

Mueller-Glaser, Klaus: *See*—
Fuchs, Peter; Mueller-Glaser, Klaus; Schuett, Dieter; and Wach, Wolfgang, 4,534,008, Cl. 364-716.000.

Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, to Bayerische Motoren Werke Aktiengesellschaft. Service-interval display for motor vehicles. 4,533,900, Cl. 340-52.00R.

Muller, Alf; Schobbe, Hermann; Loper, Bernd; and Binnewies, Hartmut, to Daimler-Benz Aktiengesellschaft. Disc wheel with ventillation passages. 4,533,184, Cl. 301-63.00R.

Muller, Johann: *See*—
Preiner, Gerhard; Huhn, Karl; Muller, Johann; Marwitz, Heinrich; and Ullrich, Kurt, 4,533,477, Cl. 252-8.900.

Mullner, Paul: *See*—
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,533,385, Cl. 75-10.00R.

Multi-Tex Products Corp.: *See*—
Dwulet, Michaelene, 4,533,597, Cl. 428-375.000.

Multifastener Corporation: *See*—
Steward, John H.; and Ladouceur, Harold A., 4,532,664, Cl. 10-162.00A.

Multinorm B.V.: *See*—
Liet, Cornelis H., 4,532,758, Cl. 56-341.000.

Mulvany, Richard B.: *See*—
Engwall, Mats A.; and Mulvany, Richard B., 4,533,186, Cl. 308-5.00R.

Munter, Ernst A., to Northern Telecom Limited. Digital circuit for determining the envelope frequency of PCM encoded call progress tones in a telephone system. 4,534,041, Cl. 375-94.000.

Murachi, Mikio: *See*—
Hashimoto, Kametaro; Ushitani, Kenji; Noda, Fumiyoshi; Sugiyama, Masahiko; and Murachi, Mikio, 4,533,579, Cl. 428-36.000.

Murakami, Fumiki: *See*—
Matsumura, Hiroshi; Otani, Masato; and Murakami, Fumiki, 4,533,750, Cl. 562-600.000.

Murakami, Kenji: *See*—
Takino, Kenichi; Yamasaki, Eiji; and Murakami, Kenji, 4,533,316, Cl. 431-32.000.

Murakami, Ryoichi; Uyeda, Yoshiyuki; Nishijima, Kanji; and Yanagihara, Tetsuo, to Nippon Paint Co., Ltd. Rust preventive cationic electrocoating. 4,533,683, Cl. 523-414.000.

Muramoto, Setsuo: *See*—
Hansoka, Yuzuru; Murayama, Takeshi; Muramoto, Setsuo; and Matsuura, Tamizo, 4,533,518, Cl. 422-70.000.

Muranyi, Istvan; Balazs, Laszlone ; Molnar, Jozsef; Burda, Ferencne ; Metzler, Maria; and Szerdahelyi, Lajos, to Labor Muszeripari Muvek. Blood typing apparatus. 4,533,638, Cl. 435-288.000.

Murao, Masami, to Kabushiki Kaisha Murao Shoten. Connection for a jewelry band. 4,532,682, Cl. 24-616.000.

Murase, Daihachiro. Combustion means for solid fuel of low ash content. 4,532,913, Cl. 126-58.000.

Murata Manufacturing Co., Ltd.: *See*—
Mandai, Harufumi; Iwai, Kiyoshi; and Naito, Yasuyuki, 4,533,931, Cl. 357-10.000.

Murata, Masayoshi: *See*—
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,533,738, Cl. 548-194.000.

Murayama, Hiroshi: *See*—
Minamide, Hiroshi; Shintani, Takashi; and Murayama, Hiroshi, 4,533,525, Cl. 428-469.000.

Murayama, Takeshi: *See*—
Hanaoka, Yuzuru; Murayama, Takeshi; Muramoto, Setsuo; and Matsuura, Tamizo, 4,533,518, Cl. 422-70.000.

Murphy Oil Company Limited: *See*—
Bland, Linden, 4,533,366, Cl. 55-42.000.

Muschelknautz, Edgar; Rink, Norbert; and Chalupka, George, to Bayer Aktiengesellschaft. Nozzle drawing process and drawing nozzle for the separation of melts. 4,533,376, Cl. 65-5.000.

Mutschler, Ulrich: *See*—
Bastion, Patrick; Lhuillier, Francois; and Mutschler, Ulrich, 4,532,963, Cl. 139-59.000.

Myers, Ronald E., to B. F. Goodrich Company, The. Polymeric hydrophile from carboxy terminated liquid polymer, diamine and phosphazene. 4,533,726, Cl. 528-336.000.

Nabisco Brands, Inc.: *See*—
Hoagland, Frank V. N.; and Aquino, Agostino J., 4,533,426, Cl. 156-492.000.
Morris, William M.; Witzel, Frank; Puglia, Wayne J.; Mackay, Donald A. M.; Clark, K. Warren; and Patanasinth, Kanit J., 4,533,543, Cl. 424-38.000.
Ward, John, 4,533,561, Cl. 426-603.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Control device for a two stage derailleur. 4,532,825, Cl. 74-532.000.

Nagano, Tamio, to Kabushiki Kaisha Daikin Seisakusho. Clutch disk having alternatingly connected subplates between friction washers. 4,533,031, Cl. 192-106.200.

Nagashima, Akira; and Kondo, Tadashige, to Kioritz Corporation. Chain saw. 4,534,005, Cl. 364-505.000.

Nagashima, Takashi: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Yamamoto, Kiyonori; Watashi, Masahiro; Yoshinaga, Shinsuke; and Yamamoto, Toshihiko, 4,533,233, Cl. 355-8.000.

Nagata, Osamu; Inagaki, Masanari; and Yamada, Hajime, to Kawasaki Jukogyo Kabushiki Kaisha. Maneuvering system of watercraft and the like. 4,532,877, Cl. 114-144.00E.

Nagata, Wataru: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,533,730, Cl. 544-92.000.

Naito, Tsutomu: *See*—
Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, 4,533,461, Cl. 208-44.000.

Naito, Yasuyuki: *See*—
Mandai, Harufumi; Iwai, Kiyoshi; and Naito, Yasuyuki, 4,533,931, Cl. 357-10.000.

Naka, Hideo: *See*—
Kobashi, Toshiyuki; and Naka, Hideo, 4,533,538, Cl. 423-617.000.

Nakagawa, Akira: *See*—
Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, 4,533,547, Cl. 424-122.000.

Nakagawa, Takeshi: *See*—
Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, 4,532,881, Cl. 118-20.000.

Nakagawa, Toru: *See*—
Osawa, Tadao; Nakagawa, Toru; Okumura, Masamitsu; Kohno, Takashige; and Sakuma, Tokihiko, 4,532,904, Cl. 123-439.000.

Nakahara, Kichio; Matsui, Hiroshi; and Yoshiyama, Harumichi, to NGK Spark Plug Co., Ltd. Two-cycle engine. 4,532,896, Cl. 123-193.00H.

Nakai, Ken: *See*—
Iwahashi, Shoji; and Nakai, Ken, 4,532,919, Cl. 128-54.000.

Nakajima, Tadanobu: *See*—
Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Tadanobu; and Aizawa, Tatsuo, 4,533,618, Cl. 430-126.000.

Nakamura, Hiromi, to Mitsubishi Gas Chemical Company, Inc. Heat exchanging system for a heat engine. 4,532,982, Cl. 165-1.000.

Nakamura, Katsutoshi, to Kabushiki Kaisha SUIDEN. Vacuum cleaner. 4,533,371, Cl. 55-299.000.

Nakamura, Shigeru: *See*—
Ono, Shigetoshi; Harada, Toru; Suzuki, Hirohisa; Tanaka, Mitsugu; and Nakamura, Shigeru, 4,533,626, Cl. 430-562.000.

Nakamura, Sukenori: *See*—
Ikeda, Kensuke; and Nakamura, Sukenori, 4,533,929, Cl. 346-209.000.

Nakamura, Taku: *See*—
Urata, Yukihide; Moriuchi, Shigenori; Nakamura, Taku; and Ogawa, Masashi, 4,533,623, Cl. 430-309.000.

Nakamura, Tsutomu: *See*—
Itoh, Kunio; Oshima, Toshimichi; and Nakamura, Tsutomu, 4,533,687, Cl. 524-80.000.

Nakamura, Yoichi; Watarai, Shumei; and Matsuo, Shohta, to Ube Industries, Ltd. Modified polyolefin composition useful for bonding materials. 4,533,602, Cl. 428-447.000.

Nakamura, Yoshimitsu, to Matsushita Electric Works, Ltd. Rotor of coreless motor. 4,533,848, Cl. 310-237.000.

Nakane, Hisanori: *See*—
Ikegami, Yoshihiko; Kurihara, Kozo; Ichikawa, Izuo; and Nakane, Hisanori, 4,533,562, Cl. 427-3.000.

Nakane, Masami, to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted enaminone prostaglandin analogs and their use in treatment of thrombolytic disease. 4,533,673, Cl. 514-469.000.

Nakanishi Dental Mfg., Co., Ltd.: *See*—
Nakanishi, Takasuke, 4,533,324, Cl. 433-132.000.

Nakanishi, Takasuke, to Nakanishi Dental Mfg., Co., Ltd. Air driven dental handpiece. 4,533,324, Cl. 433-132.000.

Nakano, Kenji; Takahashi, Takao; Moriwaki, Hisayoshi; and Shimada, Keiichiro, to Sony Corporation. Video tape recorder for re-recording audio signals. 4,533,963, Cl. 360-19.100.

Nakashima, Kazumi: *See*—
Hayakawa, Kizo; Mori, Nobuyuki; Watanabe, Yoshio; and Nakashima, Kazumi, 4,532,898, Cl. 123-276.000.

Nakazato, Kunio; and Ozawa, Kazuya, to Sony Corporation. Zoom lens operating mechanisms. 4,533,218, Cl. 350-430.000.

Nakazumi, Tadataka: *See*—
Yokooku, Katsuhiko; Kaneko, Tadashi; and Nakazumi, Tadataka, 4,532,905, Cl. 123-443.000.

Nambudiri, Easwaran C. N.: *See*—
Eckert, Alton B.; and Nambudiri, Easwaran C. N., 4,534,018, Cl. 365-228.000.

Napolitano, Pellegrino E., to Hudson Engineering Company. Check valve having replaceable valve assembly. 4,532,958, Cl. 137-454.200.

Naslund, Erik I.: *See*—
Reed, Steven P.; and Naslund, Erik I., 4,533,427, Cl. 156-500.000.

National Distillers and Chemical Corporation: *See*—
Harris, Eugene G., 4,533,759, Cl. 568-648.000.

National Research Development Corporation: *See*—
Field, Richard E., 4,532,660, Cl. 623-18.000.
McCanny, John V.; and McWhirter, John G., 4,533,993, Cl. 364-200.000.

National Rivet & Manufacturing Company: *See*—
Hallock, Donald W.; Hartmann, Thomas M.; and Engebretson, Marvin, 4,533,075, Cl. 227-55.000.

National Semiconductor Corporation: *See*—
Balakrishnan, Ramanatha V., 4,533,839, Cl. 307-270.000.

Natoli, Giuseppe: *See*—
Cargnino, Francesco; Natoli, Giuseppe; and Lorke, Horst, 4,533,479, Cl. 252-34.000.

Natsume, Toshio: *See*—
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,382, Cl. 75-0.50C.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,383, Cl. 75-0.50C.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,413, Cl. 148-420.000.

NCR Corporation: *See*—
Bangs, Richard G., 4,533,569, Cl. 427-154.000.
Besselman, Thomas P., 4,533,596, Cl. 428-341.000.
Marinelli, Nicola, 4,533,567, Cl. 427-150.000.

NEC Corporation: *See*—
Iinuma, Kazumoto, 4,533,957, Cl. 358-261.000.

Nederlandse Centrale Organisatie Voor Toegepast: *See—*
Van Gasselt, Max L. G.; and Rappoldt, Louis M., 4,532,871, Cl. 110-216.000.
Neelameggham, Ramaswami; and Priscu, John C., to AMAX Inc. Lithium metal/alloy recovery from multi-component molten salt. 4,533,442, Cl. 204-68.000.
Neelameggham, Ramaswami; Abedi, Hedayat; Priscu, John C.; and Legge, Michael H., to AMAX Inc. Process for producing varnish-bonded carbon-coated metal granules. 4,533,572, Cl. 427-216.000.
Nelson, Lorne W., to Honeywell Inc. Integrated control system for induced draft combustion. 4,533,315, Cl. 431-20.000.
Nelzow, Hartmann: *See—*
Deininger, Anton; Nelzow, Hartmann; and Farber, Karlheinz, 4,533,070, Cl. 222-439.000.
Nesbit, Larry A.: *See—*
Kinney, Wayne I.; Lasky, Jerome B.; and Nesbit, Larry A., 4,532,700, Cl. 29-576.00W.
Netravali, Arun N.: *See—*
Maxemchuk, Nicholas F.; and Netravali, Arun N., 4,534,024, Cl. 370-85.000.
Neumann, Manfred; Morgner, Henry; Forster, Harry; Jasch, Gunter; Kunack, Wilfried; Godenschweg, Martin; and Unganz, Peter, to Bakish Materials Corp. Electron-beam coating of very broad strips. 4,532,888, Cl. 118-718.000.
Neumann, Peter: *See—*
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, 4,533,612, Cl. 430-59.000.
Neuschaeffer, Karl H.; Spielau, Paul; Zoche, Gunter; and Engels, Hans-Werner, to Dynamit Nobel Aktiengesellschaft. Aqueous curable molding compositions based on inorganic ingredients and process for the production of molded parts. 4,533,393, Cl. 106-18.120.
Neuzil, Richard W.; and Fergin, Richard L., to UOP Inc. Extraction of sucrose. 4,533,398, Cl. 127-55.000.
New York University: *See—*
Maas, Renata, 4,533,628, Cl. 435-6.000.
Newland, Gordon C.; and Darnell, William R., to Eastman Kodak Company. Process for the preparation of polycarbonate polyols. 4,533,729, Cl. 528-371.000.
Newman, John E., to Phillips Petroleum Company. An induction yarn heater device. 4,533,808, Cl. 219-10.49A.
News Log International: *See—*
Jewer, Alan A., 4,534,031, Cl. 371-38.000.
Newsome, George W.: *See—*
Giacometti, Alberto M.; and Newsome, George W., 4,534,064, Cl. 455-601.000.
Newsome, Reginald W.: *See—*
Nichols, Walter A.; and Newsome, Reginald W., 4,532,943, Cl. 131-336.000.
NGK Insulators, Ltd.: *See—*
Takeuchi, Yukihisa; and Fujita, Tadashi, 4,533,584, Cl. 428-116.000.
NGK Spark Plug Co., Ltd.: *See—*
Nakahara, Kichio; Matsui, Hiroshi; and Yoshiyama, Harumichi, 4,532,896, Cl. 123-193.00H.
NHK Spring Co., Ltd.: *See—*
Ohno, Akira; Koyama, Hiroshi; Inoue, Kanji; and Ozawa, Hiroaki, 4,533,402, Cl. 148-12.400.
Nicholls, Douglas C., to Morris Rod Weeder Co. Ltd. Spring-loaded ground engaging tool. 4,532,790, Cl. 172-266.000.
Nichols, James; and Markus, Franklyn M., to Markus, Franklyn M. Portable seating assembly. 4,533,179, Cl. 297-440.000.
Nichols, Walter A.; and Newsome, Reginald W., to Philip Morris Incorporated. Adjustable filter cigarette. 4,532,943, Cl. 131-336.000.
Nieder, John J.: *See—*
Gee, Gary W.; Shumate, Daniel L.; Nieder, John J.; Bump, Boyd E.; and Kource, Robert D., 4,532,815, Cl. 73-864.630.
Niedrig, Franklin: *See—*
Kuhnert, Volker; and Niedrig, Franklin, 4,533,046, Cl. 206-389.000.
Nihon Almit Kabushiki Kaisha: *See—*
Hasegawa, Masayuki, 4,533,404, Cl. 148-23.000.
Nihon Seikan Kabushiki Kaisha: *See—*
Kawamata, Kiyoshi; and Kawamata, Seizi, 4,533,064, Cl. 220-273.000.
Nippon Electric Co., Ltd.: *See—*
Fujita, Toshio, 4,533,838, Cl. 307-270.000.
Iinuma, Kazumoto, 4,534,055, Cl. 381-34.000.
Saito, Shojiro; and Azumaya, Noriyoshi, 4,533,266, Cl. 400-208.000.
Nippon Light Metal Company Ltd.: *See—*
Oda, Kazutaka; Ohba, Hisao; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,533,444, Cl. 204-129.430.
Nippon Oil Company, Ltd.: *See—*
Matsuno, Mitsuo; Kudoh, Michio; and Imai, Hiroshuke, 4,533,781, Cl. 585-516.000.
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Katoh, Osamu, 4,533,535, Cl. 423-447.400.
Nippon Oil & Fats Co., Ltd.: *See—*
Komai, Takeshi; Matsuyama, Kazuo; and Saigo, Takuya, 4,533,699, Cl. 525-277.000.
Nippon Paint Co., Ltd.: *See—*
Murakami, Ryoichi; Uyeda, Yoshiyuki; Nishijima, Kanji; and Yanagihara, Tetsuo, 4,533,683, Cl. 523-414.000.
Nippon Pet Food Company, Ltd.: *See—*
Ohki, Tomio; and Yoshioka, Toshio, 4,532,890, Cl. 119-1.000.
Nippon Seiko Kabushiki Kaisha: *See—*
Ueda, Takeo, 4,533,158, Cl. 280-804.000.
Nippon Shinyaku Co., Ltd.: *See—*
Kawamata, Masanobu; Ushimaru, Koichi; Goshi, Hiroyuki; and Miyasako, Hideichi, 4,533,552, Cl. 424-78.000.
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Kura, Kohei; Yagi, Masahiro; and Shirahase, Ichiro, 4,533,668, Cl. 514-321.000.
Nippon Soda Co. Ltd.: *See—*
Maruyama, Hiromi; Sasaoka, Seiji; Kiuchi, Mitsuo; and Kanehara, Hironori, 4,533,557, Cl. 426-61.000.
Nippon Soken, Inc.: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,533,847, Cl. 310-181.000.
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; and Tokoro, Setsuo, 4,532,798, Cl. 73-116.000.
Nishida, Kenji, to Kabushiki Kaisiia Komatsu Seisakusho. Turnover device. 4,533,291, Cl. 414-728.000.
Nishiguchi, Ikuzo: *See—*
Inoue, Hiroshige; Fukushima, Kenichi; and Nishiguchi, Ikuzo, 4,533,732, Cl. 544-172.000.
Nishihama, Hitoshi; Gotoda, Katsuhiko; Motomura, Minoru; Nakajima, Tadanobu; and Aizawa, Tatsuo, to Mita Industrial Company, Ltd. Method for transferring toner image. 4,533,618, Cl. 430-126.000.
Nishijima, Kanji: *See—*
Murakami, Ryoichi; Uyeda, Yoshiyuki; Nishijima, Kanji; and Yanagihara, Tetsuo, 4,533,683, Cl. 523-414.000.
Nishikawa, Masaji, to Olympus Optical Company Ltd. Optical image projector for projecting an erect positive image of unity magnification and for minimizing degradation in resolution. 4,533,228, Cl. 355-1.000.
Nishikawa, Satoshi: *See—*
Kakinuma, Hiroaki; Yoshida, Mamoru; and Nishikawa, Satoshi, 4,533,564, Cl. 427-39.000.
Nishikawa, Yasuhisa: *See—*
Tanaka, Yoshio; Nishikawa, Yasuhisa; Hasumi, Ryoichi; and Koizumi, Takashi, 4,532,818, Cl. 74-10.330.
Nishikori, Tsutomu: *See—*
Otani, Toshiaki; Chihara, Takeshi; and Nishikori, Tsutomu, 4,533,027, Cl. 192-8.00C.
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Morishita, Masakazu, to Handotai Kenkyu Shinkokai. Three terminal semiconductor laser. 4,534,033, Cl. 372-50.000.
Nissan Motor Co., Ltd.: *See—*
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,533,340, Cl. 474-28.000.
Endo, Toshio, 4,532,671, Cl. 16-7.000.
Sugano, Kazuhiko, 4,532,829, Cl. 74-869.000.
Yokota, Akira, 4,533,341, Cl. 474-109.000.
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Bill, Jacob C., 4,533,975, Cl. 361-323.000.
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Austin, Hollis B., 4,533,864, Cl. 324-51.000.
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Read, Clifford D.; Sawyer, William D.; and Chadwick, Donald T., 4,533,791, Cl. 179-2.00R.
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Long, William H., 4,534,035, Cl. 372-85.000.
Northrup, Karl A., to Xerox Corporation. Mechanism and method for controlling the temperature and output of a fluorescent lamp. 4,533,854, Cl. 315-117.000.
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Gyulavari, Imre, 4,533,470, Cl. 210-96.100.
Nowak, Rudolf: *See*—
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Nozawa, Ryoichiro; and Kiya, Nobuyuki, to Fanuc Ltd. Numerical control system. 4,534,001, Cl. 364-474.000.
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Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., 4,533,762, Cl. 568-677.000.
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Ricketts, Thomas E., 4,533,181, Cl. 299-2.000.
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Olson, Daniel R.; and O'Donnell, Timothy W., 4,533,595, Cl. 428-336.000.
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Haque, Yusuf; and Ofner, Erwin, 4,533,876, Cl. 330-253.000.
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Ogle, David W. Toasting process using a toast guard. 4,533,558, Cl. 426-466.000.
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Ohki, Tomio; and Yoshioka, Toshio, to Nippon Pet Food Company, Ltd. Pet litter. 4,532,890, Cl. 119-1.000.
Ohkoshi, Akio; Toyama, Takashi; and Watanabe, Toshiro, to Sony Corporation. Color projector apparatus of single cathode ray tube type. 4,533,850, Cl. 313-36.000.
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Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Morishita, Masakazu, 4,534,033, Cl. 372-50.000.
Ohno, Akira; Koyama, Hiroshi; Inoue, Kanji; and Ozawa, Hiroaki, to NHK Spring Co., Ltd. Method of manufacturing a hollow stabilizer. 4,533,402, Cl. 148-12.400.
O'Holla, Robert H., to Ethicon, Inc. Two-piece tissue fastener with ratchet leg staple and sealable latching receiver. 4,532,926, Cl. 128-334.00C.
Ohsaki, Ichiro; Hasegawa, Tetsuo; and Suematsu, Koushi, to Canon Kabushiki Kaisha. Developer for electrophotography of toner and microencapsulated additive. 4,533,616, Cl. 430-110.000.
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Kawasaki, Tatsuo; Takada, Isao; and Ohtsubo, Hiroshi, 4,533,806, Cl. 219-8.500.
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Yoshida, Tuneo; Oishi, Kengo; and Yagi, Motohiko, 4,533,968, Cl. 360-130.210.
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Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, 4,533,547, Cl. 424-122.000.
Okada, Takashi: *See*—
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Okamoto, Akihiro: *See*—
Maeda, Tetsuro; Okamoto, Akihiro; Shimizu, Yoshimitsu; and Nomoto, Takashi, 4,533,698, Cl. 525-73.000.
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Okazaki, Kiyoshi: *See*—
Yasuhara, Hiroshi; Fujita, Hitoshi; and Okazaki, Kiyoshi, 4,533,946, Cl. 358-111.000.
Oki Electric Industry Co., Ltd.: *See*—
Kakinuma, Hiroaki; Yoshida, Mamoru; and Nishikawa, Satoshi, 4,533,564, Cl. 427-39.000.
Okino, Susumu: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; and Okino, Susumu, 4,533,531, Cl. 423-242.000.
Okita, Koichi, to Sumitomo Electric Industries, Ltd. Gas-permselective composite membranes and process for the production thereof. 4,533,369, Cl. 55-158.000.
Okita, Tsutomu, to Fuji Photo Film Co., Ltd. Method for surface treatment of ferromagnetic fine powder and forming a magnetic recording device. 4,533,565, Cl. 427-44.000.
Okoshi, Koichi; and Uematsu, Ryuichi, to Midori Anzen Industry Co., Ltd. Antistatic footwear. 4,532,724, Cl. 36-7.10R.
Okoshi, Noboru; and Ikeda, Takenori, to Dainippon Ink and Chemicals, Inc. Coating resin composition. 4,533,716, Cl. 528-73.000.
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Yoden, Yoshimasa; Okuda, Tsuneo; Fuchigami, Eiji; and Kuwabara, Toshihiro, 4,533,358, Cl. 8-94.200.
Okuhara, Hiroo: *See*—
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Okumura, Fumio; and Kawai, Akira, to Mitsubishi Paper Mills, Ltd. Microcapsule and process for their production. 4,533,599, Cl. 428-402.210.
Okumura, Masamitsu: *See*—
Osawa, Tadao; Nakagawa, Toru; Okumura, Masamitsu; Kohno, Takashige; and Sakuma, Tokihiko, 4,532,904, Cl. 123-439.000.
Olander, Jitka V.: *See*—
Lewis, Charles, Jr.; Olander, Jitka V.; and Tolbert, William R., 4,533,496, Cl. 260-112.00R.
O'Leary, Richard P., to Betz Laboratories, Inc. Liquid mixing device. 4,533,123, Cl. 261-61.000.
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O'Connor, James M.; Scardera, Michael; and Grosser, Frank R., 4,533,485, Cl. 252-156.000.
O'Connor, James M.; Lickei, Donald L.; Rosin, Michael L.; and Donze, Richard J., 4,533,717, Cl. 528-78.000.
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Trotz, Samuel I.; and Farmer, Douglas A., Jr., 4,533,736, Cl. 546-290.000.
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,533,388, Cl. 75-76.000.
Oliver, Gary R. Disconnectable automotive vehicle frame. 4,533,172, Cl. 296-185.000.

Oliver, Larry R.: *See—*
Miranti, Joseph P., Jr.; Oliver, Larry R.; and Johnson, Clyde O., 4,533,342, Cl. 474-201.000.

Olson, Daniel R.; and O'Donnell, Timothy W., to General Electric Company. Abrasion-resistant resinous articles. 4,533,595, Cl. 428-336.000.

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Olson, Phillip A.: *See—*
Olson, Harry W.; and Olson, Phillip A., 4,533,897, Cl. 337-408.000.

Olympus Optical Co., Ltd.: *See—*
Kurita, Hiroyuki; Kobayashi, Yuko; Dosaka, Shinichi; Kikuchi, Juro; Takase, Hiroshi; and Harada, Kenichi, 4,533,220, Cl. 350-507.000.
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Olyphant, Murray, Jr., to Minnesota Mining and Manufacturing Co. Sheet material for and a cable having an extensible electrical shield. 4,533,784, Cl. 174-36.000.

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Omura, Satoshi; Nakagawa, Akira; Hashimoto, Hiroshi; Kojima, Yasuhiko; Iwai, Yuzuru; Oiwa, Ruiko; and Hirano, Atsushi, to Kitasato Institute, The. Antiviral antibiotic substance AM-2722 and process for production thereof. 4,533,547, Cl. 424-122.000.

Onaka, Tatsumi: *See—*
Shiraishi, Minoru; Numata, Yoshimi; Tano, Hiroshi; and Onaka, Tatsumi, 4,532,878, Cl. 114-222.000.

Onal, Hasan F., to Dresser Industries, Inc. High speed centrifugal pump and method for operating same at reduced noise levels. 4,533,294, Cl. 415-119.000.

Ondetti, Miguel A.: *See—*
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O'Neill, Michael J., to Perkin-Elmer Corporation, The. Liquid level sensor. 4,532,799, Cl. 73-295.000.

Ono, Shigetoshi; Harada, Toru; Suzuki, Hirohisa; Tanaka, Mitsugu; and Nakamura, Shigeru, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material with 4-(paranitrophenylazo)naphthol dyes. 4,533,626, Cl. 430-562.000.

Ono, Takuhiro: *See—*
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Opie, Eric A.: *See—*
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Orio, Alfred P., to Shipley Company Inc. U.V. Curable composition. 4,533,445, Cl. 204-159.190.

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Balko, Edward N.; and Moulthrop, Lawrence C., 4,533,455, Cl. 204-279.000.

Orser, David A.; and Bulow, Jeffrey A., to General Electric Company. Light valve projection system with improved writing control and reduced fluid degradation. 4,533,216, Cl. 350-361.000.

Orter, Ralph H. Heat controlling cooker. 4,532,911, Cl. 126-27.000.

Ortloff, John E., to Exxon Production Research Co. Combination mooring system. 4,532,879, Cl. 114-230.000.

Osaka Municipal Government: *See—*
Inoue, Hiroshige; Fukushima, Kenichi; and Nishiguchi, Ikuzo, 4,533,732, Cl. 544-172.000.

Osawa, Tadao; Nakagawa, Toru; Okumura, Masamitsu; Kohno, Takashige; and Sakuma, Tokihiko, to Hitachi, Ltd. Air-fuel ratio control device for internal combustion engines. 4,532,904, Cl. 123-439.000.

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Mally, Timothy G.; Rattmann, James A.; and Borsuk, Alvin, 4,532,751, Cl. 53-396.000.

Oshima, Toshimichi: *See—*
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Ossowski, Manfred: *See—*
Michel, Wolfgang; Paul, Heinz; Rummel, Andreas; Seher, Gero; Ossowski, Manfred; and Heberlein, Irmtrud, 4,533,438, Cl. 201-31.000.

Ostendorf, Larry P., to Divers Supply Co., Inc. Dive timer. 4,533,256, Cl. 368-111.000.

Ostenson, Jerome E.: *See—*
Verhoeven, John D.; Gibson, Edwin D.; Finnemore, Douglas K.; Ostenson, Jerome E.; Schmidt, Frederick A.; and Owen, Charles V., 4,532,703, Cl. 29-599.000.

Ostermann, Jerry L. Livestock scale. 4,533,008, Cl. 177-132.000.

O'Sullivan, Eileen F.: *See—*
Gust, Lawrence J.; O'Sullivan, Eileen F.; and Wood, Ronald C., Jr., 4,533,509, Cl. 264-171.000.

Otani, Masato: *See—*
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Otani, Toshiaki; Chihara, Takeshi; and Nishikori, Tsutomu, to Mazda Motor Corporation; and Delta Kogyo Co., Ltd. Friction brake assembly. 4,533,027, Cl. 192-8.00C.

Otis Elevator Company: *See—*
Salihi, Jalal T., 4,533,862, Cl. 318-798.000.

Otis Engineering Corp.: *See—*
Barker, James M., 4,532,989, Cl. 166-188.000.

Otty, Malcolm. Composite insulation material. 4,533,580, Cl. 428-36.000.

Ou, Jan-Chou. Multi-image camera. 4,533,224, Cl. 354-77.000.

Outboard Marine Corporation: *See—*
Bland, Gerald F., 4,533,331, Cl. 440-88.000.
Kueny, Don F., 4,532,895, Cl. 123-187.50R.

Overland, Christian H.: *See—*
Bengmark, Stig; Broome, Albert; and Overland, Christian H., 4,533,356, Cl. 604-358.000.

Owaki, Isao; Saito, Susumu; and Yamazaki, Masami, to Victor Company of Japan, Limited. Multi-track digital recording and playback system. 4,533,964, Cl. 360-22.000.

Owen, Charles V.: *See—*
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Owen, Derek G.: *See—*
Kapolas, William J.; Vercillo, Peter A.; Dowling, Daniel; Beatovic, George S.; Clifton, Oscar N.; Gatz, Ronald; Harford, Eugene W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.

Owen, Timothy C.: *See—*
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Owens-Illinois, Inc.: *See—*
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Ozaki, Syunzaburo: *See—*
Hibino, Yoshitaka; and Ozaki, Syunzaburo, 4,532,900, Cl. 123-327.000.

Ozawa, Hiroaki: *See—*
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Ozawa, Kazuya: *See—*
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Ozeki, Jiro, to Slidex Corporation. Film jacket. 4,533,048, Cl. 206-455.000.

Ozeki, Jiro, to Slidex Corporation. Slide file sheet. 4,533,049, Cl. 206-455.000.

P.P.M.D.: *See—*
Rivkin, Bernard W.; and Monfort, Michael R., 4,533,288, Cl. 411-176.000.

Pacha, Antonin: *See—*
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Padberg, Peter: *See—*
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Padgitt, Howard R.: *See—*
Rayburn, Charles C.; Padgitt, Howard R.; and Flair, Henry J., 4,533,813, Cl. 219-121.0LH.

Paek, Un C.; and Schroeder, Charles M., Jr., to AT&T Technologies, Inc. Modified zirconia induction furnace. 4,533,378, Cl. 65-3.120.

Paez, Ricardo; and Rodriguez, Jorge R., to International Business Machines Corporation. Self-clocked signature analyzer. 4,534,030, Cl. 371-25.000.

Palmqvist, Sune H.: *See—*
Johnsson, Bo A.; Losell, Ingvar E.; and Palmqvist, Sune H., 4,533,516, Cl. 422-46.000.

Panovic, Vlatko, to Drexore Resources Inc. Claw hammer for driving and extracting nails. 4,533,116, Cl. 254-26.00R.

Papier-und Kunststoff-Werke Linnich GmbH: *See—*
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Paradyne Corporation: *See—*
Betts, William L.; and Martinez, Kenneth, 4,534,036, Cl. 375-10.000.
Martinez, Kenneth; and Betts, William L., 4,534,026, Cl. 370-100.000.

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Parisi, David A.: *See—*
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Parker Chemical Company: *See—*
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Parker-Hannifin Corporation: *See—*
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Parlec, Inc.: *See—*
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Parlman, Robert M.: *See—*
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Parsons, Gerald R., to Barber-Colman Company. Reversible rotary actuator. 4,533,800, Cl. 200-61.390.
Partington, Albert J.; and Warner, Ronald E., to Westinghouse Electric Corp. Turbine blade with integral shroud. 4,533,298, Cl. 416-191.000.
Paseri, Jacques, to R.E.O.S.C. (Recherches et Etudes d'Optique et de Sciences Connexes); and Societe Nationale Industrielle et Aerospatiale. Mounting device for supporting a component, especially a mirror or an antenna reflector in a spacecraft. 4,533,100, Cl. 244-158.00R.
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Gebhard, Georg R. U.; Hein, Klaus R. G.; and Glaser, Wolfgang, 4,533,532, Cl. 423-244.000.
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Reinelt, Karlheinz; and Witt, Wolfram, 4,532,851, Cl. 89-7.000.
Rhone-Poulenc Specialites Chimiques: *See—*
Cordier, Georges, 4,533,771, Cl. 568-842.000.
Rhyner, Hans-Ulrich, to Maag Gear-Wheel & Machine Co., Ltd. Displacement detecting system in a multi-axis measuring system, especially for use with a gear wheel grinding or inspecting machine. 4,534,007, Cl. 364-560.000.
Riaboff, Peter. Baseball glove. 4,532,653, Cl. 2-19.000.
Rice, Richard E.: *See—*
Grady, John K.; and Rice, Richard E., 4,534,051, Cl. 378-099.000.
Rich, William N.: *See—*
Bishop, Ralph L.; Rich, William N.; and Kowalski, Walter C., 4,533,894, Cl. 337-107.000.
Richard, Jacques R., to Manufacture de Machines du Haut-Rhin. Conveyor for objects treated while continuously in motion. 4,533,038, Cl. 198-646.000.
Richards, Powell: *See—*
Srivastava, Suresh C.; Meinken, George E.; and Richards, Powell, 4,533,541, Cl. 424-1.100.
Richards, Walter L., to Methane Drainage Ventures. Process for production of oil and gas through horizontal drainholes from underground workings. 4,533,182, Cl. 299-2.000.
Richter, Wolfgang: *See—*
Kummer, Rudolf; Richter, Wolfgang; Schwirten, Kurt; and Stops, Peter, 4,533,757, Cl. 568-454.000.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for forming uniform flow rubble bed. 4,533,181, Cl. 299-2.000.
Ricoh Company, Ltd.: *See—*
Sakurai, Akira, 4,533,959, Cl. 358-280.000.
Takahashi, Akira, 4,533,227, Cl. 354-403.000.
Rieck, Richard E.: *See—*
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; and William, John S., 4,533,995, Cl. 364-200.000.
Rieter Machine Works Ltd.: *See—*
Bischofberger, Jurg, 4,532,759, Cl. 57-264.000.
Riganti, Innocente, to Innocente Riganti Officine Meccaniche S.p.A. Spacer-damper for a bundled conductor for an electric line. 4,533,785, Cl. 174-42.000.
Riggle, Peter: *See—*
White, Maurice A.; Riggle, Peter; and Emigh, Stuart G., 4,532,766, Cl. 60-517.000.
Rinehart, Nerl D., to Alpha Gauge & Instrument Company. Kinetic fluid sampler. 4,532,813, Cl. 73-863.020.
Ringel, Helmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for the separation and recycling of NO_x gas constituents through adsorption and desorption on a molecular sieve. 4,533,365, Cl. 55-28.000.
Rink, Norbert: *See—*
Muschelknautz, Edgar; Rink, Norbert; and Chalupka, George, 4,533,376, Cl. 65-5.000.
RIS Irrigation Systems Pty. Ltd.: *See—*
Tucker, Alfred D., 4,533,083, Cl. 239-542.000.
Ritson, Carl: *See—*
Danby, Hal C.; and Ritson, Carl, 4,533,350, Cl. 604-253.000.
Ritter, Paul B.: *See—*
Dilgren, Richard E.; and Ritter, Paul B., 4,532,993, Cl. 166-303.000.
Rivers, John; Kramer, Charles D.; and Cox, Robert L., to Weyerhaeuser Company. Suspension firing of hog fuel, other biomass or peat. 4,532,873, Cl. 110-347.000.
Rives, Allen K.: *See—*
Bailey, Thomas F.; Campbell, John E.; Rives, Allen K.; and Shah, Nehal M., 4,533,003, Cl. 175-269.000.
Rivkin, Bernard W.; and Monfort, Michael R., to P.P.M.D. Drive fastener. 4,533,288, Cl. 411-176.000.
Robert Bosch GmbH: *See—*
Buchner, Norbert; Eberspacher, Rolf; and Liede, Dieter, 4,533,063, Cl. 220-270.0x0.
Esper, Friedrich J.; and Zeller, Robert, 4,533,392, Cl. 75-230.000.
Heitmann, Jurgen, 4,534,037, Cl. 375-25.000.
Hoppel, Rainer, 4,532,906, Cl. 123-470.000.
Odone, Giovanni, 4,533,226, Cl. 354-403.000.
Steinbrenner, Ulrich, 4,532,908, Cl. 123-493.000.
Robertshaw Controls Company: *See—*
Kimmel, Steven A., 4,533,973, Cl. 361-253.000.
Robertson, David W., to Eli Lilly and Company. Anti-convulsant fluorenylalkylimidazole derivatives, compositions, and method of use. 4,533,670, Cl. 514-399.000.
Robertson, David W., to Eli Lilly and Company. Inotropic agents. 4,533,734, Cl. 514-303.000.
Robinson, Daniel E.: *See—*
Norling, Thomas B.; Polkowski, Joseph H.; Poulsen, Jeffrey A.; and Robinson, Daniel E., 4,533,914, Cl. 340-825.790.
Robinson, Lee F.: *See—*
Dente, Mario; Porcari, Guiliano; and Robinson, Lee F., 4,533,459, Cl. 208-11.0LE.
Robison, Robert L.: *See—*
Buddenbaum, Harry C.; and Robison, Robert L., 4,533,542, Cl. 424-31.000.
Robles, Benjamin R.: *See—*
Bresson, Clarence R.; Robles, Benjamin R.; and Parlman, Robert M., 4,533,466, Cl. 209-167.000.
Robotic Vision Systems, Inc.: *See—*
DiMatteo, Paul; and Hecker, Joel, 4,533,828, Cl. 250-216.000.

Rochon, Fernande D.; and Kong, Pi-Chang. Platinum (II) compounds and their preparation. 4,533,502, Cl. 546-8.000.
Rockcor, Inc.: *See—*
Poole, Donald R., 4,533,416, Cl. 149-35.000.
Rocket Research Company: *See—*
Clark, Edward C.; and Huxtable, Douglas D., 4,532,778, Cl. 62-477.000.
Rockwell International Corp.: *See—*
Wilkis, Anthony J., 4,533,206, Cl. 339-258.00R.
Rodau, Andrew G.: *See—*
Goldin, Abraham; and Rodau, Andrew G., 4,533,139, Cl. 273-73.00J.
Rode, Klaus: *See—*
Sartor, Bruno; and Rode, Klaus, 4,533,089, Cl. 242-7.210.
Roderhoff, Bernhard: *See—*
Kluth, Hermann; Roderhoff, Bernhard; Friedemann, Wolfgang; Wegner, Jurgen; and Dierichs, Wolfgang, 4,533,490, Cl. 252-305.000.
Rodgers, Lowell A.: *See—*
Jasperson, Carl R., 4,533,240, Cl. 355-125.000.
Rodgers, Vernon C.: *See—*
Jasperson, Carl R., 4,533,240, Cl. 355-125.000.
Rodriguez, Alfonzo S., Jr.; and Anderson, Jeffrey A., to Wright, Robert L. Multiple sport training device. 4,533,138, Cl. 273-26.00R.
Rodriguez, Jorge R.: *See—*
Paez, Ricardo; and Rodriguez, Jorge R., 4,534,030, Cl. 371-25.000.
Roebuck, Malcolm J., to Bagde-A-Minit Ltd. Button assembler. 4,532,684, Cl. 29-4.000.
Roemer, Dietmar: *See—*
Zeugner, Horst; Roemer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, 4,533,662, Cl. 514-221.000.
Rogers, Donald E., Jr.: *See—*
Eloranta, Vaito K.; Peisach, Joel M.; and Rogers, Donald E., Jr., 4,534,053, Cl. 378-167.000.
Rogers, Jerrold J.; and Trumps, Joseph S., to Tektronix, Inc. Stepping motor drive circuit. 4,533,861, Cl. 318-696.000.
Rohde & Schwarz GmbH & Co. KG: *See—*
Zirwick, Kurt, 4,533,866, Cl. 324-77.00B.
Rohm and Haas Company: *See—*
Bollinger, Joseph M., 4,533,482, Cl. 252-56.00R.
Rohr, Otto: *See—*
Durr, Dieter; Rohr, Otto; and Bohner, Beat, 4,533,380, Cl. 71-88.000.
Rojey, Alexandre; Bonifay, Regis; and Cariou, Jean-Paul, to Institut Francais du Petrole. Process for producing cold and/or heat by means of an absorption cycle comprising at least two absorption steps. 4,532,773, Cl. 62-101.000.
Rolls-Royce Limited: *See—*
Mills, David; Lindahl, Anthony T.; and Kington, Alan D., 4,532,974, Cl. 164-132.000.
Roos, Charles E.: *See—*
Kenny, Garry R.; Sommer, Edward J., Jr.; and Roos, Charles E., 4,533,053, Cl. 209-636.000.
Sommer, Edward J., Jr.; Kenny, Garry R.; and Roos, Charles E., 4,533,054, Cl. 209-687.000.
Rosanoff, Kenneth A.: *See—*
Maldonado, Reynaldo L.; and Rosanoff, Kenneth A., 4,533,634, Cl. 435-240.000.
Rosbak, John: *See—*
Willer, David A.; Rosbak, John; and McCombs, Daniel G., 4,533,108, Cl. 248-467.000.
Rosenberg, Stephan, to MADAG Maschinen- und Apparatebau Dietikon AG. Method and apparatus for making knotted rugs. 4,533,163, Cl. 289-1.500.
Rosenquist, Niles R., to General Electric Company. Flame retardant polycarbonate compositions. 4,533,690, Cl. 524-161.000.
Rosin, Michael L.: *See—*
O'Connor, James M.; Lickei, Donald L.; Rosin, Michael L.; and Donze, Richard J., 4,533,717, Cl. 528-78.000.
Ross, M. Andrew. Compact crank drive mechanism. 4,532,819, Cl. 74-44.000.
Rotem, Abraham I., to FDX Patents Holding Company, N.V. Thermal-mechanical treatment for copper alloys. 4,533,412, Cl. 148-411.000.
Rothe, Ulrich: *See—*
Dittmar, Heinz; Beckmann, Manfred; Dorr, Karl-Heinz; Rothe, Ulrich; and Sander, Ulrich, 4,533,537, Cl. 423-522.000.
Rotherham, William D. B. Building block. 4,532,748, Cl. 52-605.000.
Roule, Richard L.; Sorbo, Peter J.; and Kimball, John J., to American Bank Note Company. Web of adhesive labels. 4,533,586, Cl. 428-137.000.
Roussel, Michel: *See—*
Courty, Philippe; Roussel, Michel; Leporq, Serge; Le Page, Jean-Francois; and Varin, Philippe, 4,533,650, Cl. 502-84.000.
Rowell, Lorne A., to McCormick & Company, Incorporated. Process for producing an assembler for a flexible foodstuff. 4,533,559, Cl. 426-499.000.
RTR Riotinto Til Holding S.A.: *See—*
Dente, Mario; Porcari, Guiliano; and Robinson, Lee F., 4,533,459, Cl. 208-11.0LE.
Ruddock, Bernard J. Fencing rail members. 4,533,120, Cl. 256-52.000.
Ruhrchemie Aktiengesellschaft: *See—*
Cornils, Boy; Hibbel, Josef; Kessen, Gunther; Konkol, Werner; Lieder, Bernhard; Wiebus, Ernst; Kalbfell, Heinz; and Bach, Hanswilhelm, 4,533,755, Cl. 568-454.000.
Rummel, Andreas: *See—*
Michel, Wolfgang; Paul, Heinz; Rummel, Andreas; Seher, Gero; Ossowski, Manfred; and Heberlein, Irmtrud, 4,533,438, Cl. 201-31.000.
Rundell, Herbert A., to Texaco Inc. Stabbing box and safety slip for making tubing connections. 4,533,162, Cl. 285-27.000.
Russell, Alexander H.: *See—*
McClinton, John L.; and Russell, Alexander H., 4,533,568, Cl. 427-135.000.
Ryang, Hong-Son, to General Electric Company. Silicon functionalized norbornane carboxyimide and methods for making. 4,533,737, Cl. 548-110.000.
Rysewyk, Ambrose L., to AT&T Technologies, Inc. Apparatus for tapping and draining batteries. 4,532,953, Cl. 137-255.000.
Saarbergwerke Aktiengesellschaft: *See—*
Leibrock, Kurt; and Killich, Hans-Jurgen, 4,533,002, Cl. 173-53.000.
Sabco Limited: *See—*
Smyth, Donald N., 4,532,666, Cl. 15-22.00R.
Saigo, Takuya: *See—*
Komai, Takeshi; Matsuyama, Kazuo; and Saigo, Takuya, 4,533,699, Cl. 525-277.000.
Saint-Gobain Vitrage: *See—*
Degeilh, Robert, 4,533,697, Cl. 525-61.000.
Kramer, Carl; and Kuster, Hans-Werner, 4,533,571, Cl. 427-180.000.
Saint Martin, Francois-Xavier: *See—*
Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, 4,533,526, Cl. 423-1.000.
Saito, Isao: *See—*
Yamanaka, Motosuke; Saito, Isao; Yamatsu, Kiyomi; and Fujimoto, Takako, 4,533,669, Cl. 514-396.000.
Saito, Kunihiro, to Ichikoh Industries Limited. Apparatus for adjusting the inclination of automobile headlamp. 4,533,860, Cl. 318-673.000.
Saito, Shojiro; and Azumaya, Noriyoshi, to Nippon Electric Co., Ltd. Inked ribbon cartridge for an impact serial printer. 4,533,266, Cl. 400-208.000.
Saito, Susumu: *See—*
Owaki, Isao; Saito, Susumu; and Yamazaki, Masami, 4,533,964, Cl. 360-22.000.
Saitoh, Tadashi: *See—*
Itoh, Haruo; Tokiguchi, Katsumi; Warabisako, Terunori; Saitoh, Tadashi; and Tokuyama, Takashi, 4,533,831, Cl. 250-492.200.
Sakai, Chikaaki: *See—*
Kondo, Takashi; Sakai, Chikaaki; and Karakawa, Tadashi, 4,533,359, Cl. 8-128.00R.
Sakai, Kenji, to Pilot Ink Company. Writing instrument with movable closure. 4,533,272, Cl. 401-107.000.
Sakakibara, Mitsuhiko: *See—*
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,533,711, Cl. 526-340.400.
Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, to Eisai Co., Ltd. Process for sealing body and cap of gelatin hard capsule and apparatus therefor. 4,532,881, Cl. 118-20.000.
Sakuma, Tokihiko: *See—*
Osawa, Tadao; Nakagawa, Toru; Okumura, Masamitsu; Kohno, Takashige; and Sakuma, Tokihiko, 4,532,904, Cl. 123-439.000.
Sakurai, Akira, to Ricoh Company, Ltd. Picture processing apparatus. 4,533,959, Cl. 358-280.000.
Sakurai, Kazuhiro: *See—*
Idogaki, Takaharu; Hayashi, Ikuo; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,533,847, Cl. 310-181.000.
Salazar, Sumorfin, to Ford Motor Company. Door hinge with integral check. 4,532,675, Cl. 16-335.000.
Salihi, Jalal T., to Otis Elevator Company. Polyphase motor drive imbalance detection. 4,533,862, Cl. 318-798.000.
Salk Institute For Biological Studies, The: *See—*
Lederis, Karl P.; MacCannell, Keith L.; and Ichikawa, Tomoyuki, 4,533,654, Cl. 514-12.000.
Sama, Nicholas. Modified waterbed. 4,532,662, Cl. 5-450.000.
Samchenko, Garold P.: *See—*
Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., 4,533,243, Cl. 356-44.000.
Samcoe Holding Corporation: *See—*
Sellers, John R., 4,532,782, Cl. 68-13.00R.
Samek, Norbert E., to Transamerica Delaval Inc. Light gate assemblies, elements and manufacturing methods. 4,533,217, Cl. 350-392.000.
Sander, Ulrich: *See—*
Dittmar, Heinz; Beckmann, Manfred; Dorr, Karl-Heinz; Rothe, Ulrich; and Sander, Ulrich, 4,533,537, Cl. 423-522.000.
Sander, Wendell B., to Apple Computer, Inc. Computer with color display. 4,533,909, Cl. 340-703.000.
Sanders, Larry W.: *See—*
Penz, Perry A.; Petcavich, Robert J.; Stearns, William P.; and Sanders, Larry W., 4,533,214, Cl. 350-334.000.
Sanders, Leonardus C. M.: *See—*
van Gastel, Josephus M. M.; van Nunen, Hendrikus T.; and Sanders, Leonardus C. M., 4,532,884, Cl. 118-243.000.
Sanders, Roy C., Jr. Position indicator for high speed printers. 4,533,268, Cl. 400-322.000.
Sando Iron Works Co., Ltd.: *See—*
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,533,147, Cl. 277-26.000.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Automatic pressure control apparatus for an end-face seal plate in seal mechanism of high pressure steamer. 4,533,147, Cl. 277-26.000.

Sankyo Company, Limited: *See—*
Ikegami, Yoshihiko; Kurihara, Kozo; Ichikawa, Izuo; and Nakane, Hisanori, 4,533,562, Cl. 427-3.000.
Toda, Toshimasa; and Kurumada, Tomoyuki, 4,533,688, Cl. 524-100.000.

Sansevero, Nick. Writing instrument with plural implements cam actuated. 4,533,271, Cl. 401-29.000.

Sansevero, Vincent J., Jr.; and Skrabal, Walter F., to United Technologies Corporation. Fluid medium storage and expulsion apparatus. 4,533,067, Cl. 222-135.000.

Santor, Theodore J., Jr.; and Pearlman, Gordon E., to Western Steel Cutting, Inc. Curb stake with integral support. 4,533,112, Cl. 249-3.000.

Santrade Limited: *See—*
Lindlar, Wilhelm; and Wermeister, Gunter, 4,533,282, Cl. 407-38.000.

Saran, Mohan S.: *See—*
Campbell, Donald H.; Fifolt, Michael J.; and Saran, Mohan S., 4,533,762, Cl. 568-677.000.

Sarlos, Agoston: *See—*
Gal, Jozsef; Gyarfas, Andras; Katko , Laszlo ; Racz, Gabor; Sarlos, Agoston; and Vozari, Gyula, 4,533,912, Cl. 340-783.000.

Sartor, Bruno; and Rode, Klaus, to Uranit GmbH. Apparatus for making crisscross-wound layers to form wound bodies. 4,533,089, Cl. 242-7.210.

Sasakawa, Masumi: *See—*
Fukumoto, Hiroshi; Inoue, Sukejiro; Sasakawa, Masumi; and Doi, Shinji, 4,533,614, Cl. 430-99.000.
Inoue, Sukejiro; Fukumoto, Hiroshi; Sasakawa, Masumi; and Doi, Shinji, 4,533,617, Cl. 430-111.000.

Sasaki, Toshio: *See—*
Shiga, Akinobu; Sasaki, Toshio; and Kojima, Junpei, 4,533,706, Cl. 526-119.000.

Sasaoka, Seiji: *See—*
Maruyama, Hiromi; Sasaoka, Seiji; Kiuchi, Mitsuo; and Kanehara, Hironori, 4,533,557, Cl. 426-61.000.

Sato, Akihiro; Kikuta, Kazutsune; Uwai, Toshihiro; Matsuda, Kenji; and Hattori, Nobutaka, to Chisso Corporation. Process for producing α-olefin polymers. 4,533,705, Cl. 526-114.000.

Sato, Hideo: *See—*
Kawamura, Kouichi; Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,533,613, Cl. 430-78.000.

Sato, Hiroshi: *See—*
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,382, Cl. 75-0.50C.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,383, Cl. 75-0.50C.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,413, Cl. 148-420.000.

Sato, Ryoda. Heating sheet. 4,533,821, Cl. 219-545.000.

Sato, Takashi: *See—*
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.

Sato, Toshio: *See—*
Miyashita, Takao; and Sato, Toshio, 4,533,969, Cl. 360-132.000.

Satran, Amir; and Elka, Shmuel, to Iscar Ltd. Tool holder assembly. 4,533,283, Cl. 407-111.000.

Sauer, Wolfgang; Schmidtpott, Friedrich; Schat, Hermanus; and Freyberger, Laurin C., to ITT Industries, Inc. Integrated circuit kit with a phase-locked loop for color television receivers. 4,533,879, Cl. 331-1.00A.

Sauermann, Heinz, to U.S. Philips Corporation. Symmetrical temperature sensor. 4,533,898, Cl. 338-25.000.

Savins, Joseph G.: *See—*
Chew, Ju-Nam; and Savins, Joseph G., 4,533,084, Cl. 241-1.000.

Sawyer, William D.: *See—*
Read, Clifford D.; Sawyer, William D.; and Chadwick, Donald T., 4,533,791, Cl. 179-2.00R.

Sax, Stephen H. Fabric conditioning device. 4,532,722, Cl. 34-60.000.

Scala, Luciano C.; Alvino, William M.; and Fuller, Timothy J., to Westinghouse Electric Corp. Amine-free and surfactant-free electrodeposition of polyesters, polyamic acids, polyimides, and polyamide-imides. 4,533,448, Cl. 204-181.700.

Scardera, Michael; and Bayusik, John G., to Olin Corporation. Sulfated addition products of selected unsaturated dicarboxylic acids and poly(oxyalkylated) alcohols as anionic surfactants. 4,533,486, Cl. 252-156.000.

Scardera, Michael: *See—*
O'Connor, James M.; Scardera, Michael; and Grosser, Frank R., 4,533,485, Cl. 252-156.000.

Schaar, John. Arrow and components thereof. 4,533,146, Cl. 273-422.000.

Schaible, Walter, to Dr. Ing. h.c.F. Porsche A.G. Method for manufacturing a vehicle wheel. 4,532,786, Cl. 72-68.000.

Schat, Hermanus: *See—*
Sauer, Wolfgang; Schmidtpott, Friedrich; Schat, Hermanus; and Freyberger, Laurin C., 4,533,879, Cl. 331-1.00A.

Scheiderich, Robert F.: *See—*
Comper, Louis F.; and Scheiderich, Robert F., 4,533,305, Cl. 425-43.000.

Scheinecker, Alois: *See—*
Hargassner, Reinhard; Nugent, Thomas J.; Scheinecker, Alois; and Engel, Kurt, 4,532,981, Cl. 164-483.000.

Schellin, Donald B., deceased: *See—*
Scoccia, Adelmo A.; and Schellin, Donald B., deceased, 4,533,189, Cl. 339-17.0CF.

Schemelin, Michael P.; Kaminski, Tony L.; and Shupert, Paul T., to Simplicity Manufacturing, Inc. Clipping collector for riding mower. 4,532,755, Cl. 56-16.600.

Schenten, James L.: *See—*
Hoenle, Walter A.; Perkins, David J.; and Schenten, James L., 4,533,157, Cl. 280-718.000.

Scherer Laboratories, Inc.: *See—*
Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., 4,533,544, Cl. 424-52.000.

Schering AG.: *See—*
Burba, Christian; Goeke, Ulrich; and Esper, Norbert, 4,533,524, Cl. 427-372.200.

Schiffer, Wilhelm: *See—*
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,533,385, Cl. 75-10.00R.

Schlenk, Manfred, to Siemens Aktiengesellschaft. Circuit arrangement for identifying and storing power line faults. 4,533,865, Cl. 324-51.000.

Schmalz, Gerhardt, to Wezel GmbH & Co KG. Arrangement for manufacturing curved wall portions of heat insulating walls. 4,532,846, Cl. 83-796.000.

Schmidt, Douglass N.; Finnan, Jeffrey L.; and Lisa, Rudolph E., to BASF Wyandotte Corporation. Process for preparing a sugar and starch free spray-dried vitamin C powder containing 90 percent ascorbic acid. 4,533,674, Cl. 514-474.000.

Schmidt, Frederick A.: *See—*
Verhoeven, John D.; Gibson, Edwin D.; Finnemore, Douglas K.; Ostenson, Jerome E.; Schmidt, Frederick A.; and Owen, Charles V., 4,532,703, Cl. 29-599.000.

Schmidt, Hartmut: *See—*
von der Bey, Thomas; Jankowski, Detlef; Schmidt, Hartmut; Thoma, Klemens; and Volker, Wolfgang, 4,532,779, Cl. 62-514.00R.

Schmidt, Manfred: *See—*
Freitag, Dieter; Bottenbruch, Ludwig; and Schmidt, Manfred, 4,533,702, Cl. 525-439.000.

Schmidt-Rabenau, Hartmut: *See—*
Gronholz, Claus; and Schmidt-Rabenau, Hartmut, 4,533,255, Cl. 366-108.000.

Schmidtpott, Friedrich: *See—*
Sauer, Wolfgang; Schmidtpott, Friedrich; Schat, Hermanus; and Freyberger, Laurin C., 4,533,879, Cl. 331-1.00A.

Schneider, Wilhelm, to Deutsche Perrot-Bremse GmbH. Hydraulically operable brake, in particular, a servo brake. 4,533,022, Cl. 188-18.00R.

Schnell, Axel, to U.S. Philips Corporation. Ceramic bistable deflection element. 4,533,849, Cl. 310-330.000.

Schobbe, Hermann: *See—*
Muller, Alf; Schobbe, Hermann; Loper, Bernd; and Binnewies, Hartmut, 4,533,184, Cl. 301-63.00R.

Schoeps, Knut C., to Atlas Copco Aktiebolag. Hydraulic torque impulse tool. 4,533,337, Cl. 464-25.000.

Schreiber, William L.: *See—*
Tokarzewski, Richard J.; and Schreiber, William L., 4,533,492, Cl. 252-522.00R.

Schrijver, Jan; and Vossebeld, Arnold, to Stamicarbon B.V. Polymer powder compositions, particularly polyethylene powder compositions and objects to be made and made thereof. 4,533,696, Cl. 524-528.000.

Schroeder, Charles M., Jr.: *See—*
Paek, Un C.; and Schroeder, Charles M., Jr., 4,533,378, Cl. 65-3.120.

Schrubba, Gerald P.: *See—*
Bradshaw, Norman F.; and Schrubba, Gerald P., 4,532,983, Cl. 165-47.000.

Schubert, Hermann; Ahrens, Max; and Haissig, Manfred, to Voest-Alpine Aktiengesellschaft. Continuous casting installation. 4,532,977, Cl. 164-442.000.

Schuermeyer, Fritz L., to United States of America, Air Force. Method of making self-aligned IGFET. 4,532,695, Cl. 29-571.000.

Schuett, Dieter: *See—*
Fuchs, Peter; Mueller-Glaser, Klaus; Schuett, Dieter; and Wach, Wolfgang, 4,534,008, Cl. 364-716.000.

Schultz, Mark H.: *See—*
Luhn, Dennis A.; and Schultz, Mark H., 4,533,863, Cl. 322-28.000.

Schultz, William R., Jr.: *See—*
Elton, Richard K.; and Schultz, William R., Jr., 4,533,694, Cl. 524-449.000.

Schutte, Evert H.: *See—*
Cense, Adriaan; and Schutte, Evert H., 4,533,939, Cl. 358-28.000.

Schutten, Herman P.: *See—*
Benjamin, James A.; Lade, Robert W.; and Schutten, Herman P., 4,533,783, Cl. 136-249.000.

Schwang, Per-Eric. Lifting device. 4,533,117, Cl. 254-94.000.

Schwartz, Robert A.: *See—*
Duchesneau, Jerome G.; and Schwartz, Robert A., 4,533,296, Cl. 416-46.000.

Schwenk, Gerhard: *See—*
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,533,244, Cl. 356-71.000.

Schwirten, Kurt: *See*—
Kummer, Rudolf; Richter, Wolfgang; Schwirten, Kurt; and Stops, Peter, 4,533,757, Cl. 568-454.000.
Schwitters, Brian M., to Parker-Hannifin Corporation. Bi-directional filter wrench. 4,532,835, Cl. 81-128.000.
SCM Corporation: *See*—
Cherney, Leon; Gorman, Charles R.; Traynor, Sean G.; and Cardenas, Carlos G., 4,533,751, Cl. 564-408.000.
Scoccia, Adelmo A.; and Schellin, Donald B., deceased (by Downes, Gene, administrator), to General Dynamics Pomona Division. Zero insertion force connector. 4,533,189, Cl. 339-17.0CF.
Scott Paper Company: *See*—
Curran, John F.; and Kershaw, Thomas N., 4,533,437, Cl. 162-281.000.
Scott, William J., to Ideal Industries, Inc. Cable tie. 4,532,679, Cl. 24-16.0PB.
Sebag, Henri, to L'Oreal. Cosmetic compositions containing polyethylene glycol derivatives. 4,533,545, Cl. 424-70.000.
Sebag, Henri; and Zysman, Alexandre, to L'Oreal. Polyquaternary polysiloxane polymers. 4,533,714, Cl. 528-27.000.
Sederquist, Richard A., to United Technologies Corporation. Process for removing electrolyte vapor from fuel cell exhaust gas. 4,533,607, Cl. 429-13.000.
Seeger, Ernst: *See*—
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Haarmann, Walter, 4,533,664, Cl. 514-225.000.
Segerson, Eugene E.; and Thomas, Floyd L., to Motorola, Inc. Connectorless fiber optic package. 4,533,209, Cl. 350-96.200.
Seher, Gero: *See*—
Michel, Wolfgang; Paul, Heinz; Rummel, Andreas; Seher, Gero; Ossowski, Manfred; and Heberlein, Irmtrud, 4,533,438, Cl. 201-31.000.
Seidel, John C. Wind propulsion apparatus. 4,533,159, Cl. 280-810.000.
Seigneurin, Michel: *See*—
Garcia, Philippe; and Seigneurin, Michel, 4,533,322, Cl. 433-29.000.
Seiko Kagaku Kogyo Co., Ltd.: *See*—
Yoshioka, Shigehiko; Yamada, Hideto; Goto, Kimihiko; Adachi, Yoshio; and Miyahana, Kazuo, 4,533,434, Cl. 162-124.000.
Seki, Masaki: *See*—
Kishi, Hajimu; Seki, Masaki; and Kawasumi, Masashi, 4,533,286, Cl. 409-80.000.
Sekino, Takeo: *See*—
Yamada, Takaaki; and Sekino, Takeo, 4,533,903, Cl. 340-347.0AD.
Sekiya, Shin: *See*—
Sugihara, Masahiro; Morishita, Etsuo; Hirai, Tetsuo; and Sekiya, Shin, 4,533,292, Cl. 415-2.00R.
Selby, Donald R.: *See*—
Dahlgren, Harold P.; Taylor, James E.; Peters, Dwight W.; and Selby, Donald R., 4,532,735, Cl. 51-56.00R.
Seligman, Peter M.: *See*—
Crosby, Peter A.; Daly, Christopher N.; Money, David K.; Patrick, James F.; Seligman, Peter M.; and Kuzma, Janusz A., 4,532,930, Cl. 128-419.00R.
Sell, Richard W.: *See*—
Groat, Dennis E.; Sell, Richard W.; Kalish, Richard J.; and Melton, Horace E., 4,533,544, Cl. 424-52.000.
Sellers, John R., to Samcoe Holding Corporation. Apparatus for pad batch dyeing of tubular knitted cotton fabrics. 4,532,782, Cl. 68-13.00R.
Semsarzadeh, Mohammad A.: *See*—
Hudgin, Donald E.; and Semsarzadeh, Mohammad A., 4,533,685, Cl. 523-457.000.
Sen Gupta, Achintya K., to Lever Brothers Company. Refining. 4,533,501, Cl. 260-428.000.
Sewell, John H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Composite materials. 4,533,589, Cl. 428-174.000.
Shafer, Jules A. Accumulated thermal exposure responder and method of use. 4,533,640, Cl. 436-2.000.
Shah, Nehal M.: *See*—
Bailey, Thomas F.; Campbell, John E.; Rives, Allen K.; and Shah, Nehal M., 4,533,003, Cl. 175-269.000.
Shalaby, Shalaby W.: *See*—
Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,532,928, Cl. 128-335.500.
Shaner, Kenneth: *See*—
French, Kenneth; Kocher, Robert C.; Piorkow, Alfred; Shaner, Kenneth; and Smith, J. Thomas, 4,533,251, Cl. 356-384.000.
Shannon, William T.: *See*—
Decker, Ronald R.; and Shannon, William T., 4,533,962, Cl. 360-5.000.
Shape Inc.: *See*—
Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,533,093, Cl. 242-197.000.
Sharp, John B.: *See*—
Peck, Stephen R.; and Sharp, John B., 4,534,023, Cl. 370-58.000.
Sharp Kabushiki Kaisha: *See*—
Ikezaki, Katsuji; and Ishii, Kiyoshi, 4,533,370, Cl. 55-276.000.
Iwagami, Fusao; and Yoshimura, Hisashi, 4,533,927, Cl. 346-140.00R.
Takino, Kenichi; Yamasaki, Eiji; and Murakami, Kenji, 4,533,316, Cl. 431-32.000.
Tanaka, Shinichi; and Mineyama, Takitsugu, 4,533,837, Cl. 307-116.000.
Washizuka, Isamu; and Takeda, Yoshio, 4,533,213, Cl. 350-332.000.
Shearer, Scott A.: *See*—
Holmes, Robert G.; and Shearer, Scott A., 4,533,066, Cl. 221-211.000.
Shell Oil Company: *See*—
Dilgren, Richard E.; and Ritter, Paul B., 4,532,993, Cl. 166-303.000.
van Helden, Robert; Baardman, Frank; and Syrier, Johannes L. M., 4,533,379, Cl. 71-88.000.
Wong, P. K.; and Dickson, Mark K., 4,533,740, Cl. 549-328.000.
Sheppard, John E., to Sperry Corporation. Method of forming a low temperature multilayer photoresist lift-off pattern. 4,533,624, Cl. 430-312.000.
Sherby, Oleg D.; and Oyama, Toshimasa, to Leland Stanford Junior University, Board of Trustees of the. Ultra high carbon steel alloy and processing thereof. 4,533,390, Cl. 75-126.00Q.
Sheth, Jayesh V., to Burroughs Corporation. Automatic write system for peripheral-controller. 4,534,013, Cl. 364-900.000.
Shibakawa, Riichiro: *See*—
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,533,553, Cl. 514-460.000.
Shibata, Akira; Wada, Isao; and Yoshioka, Atsushi, to Hitachi, Ltd. Magnetic recording apparatus with level adjusting means for mixed luminance, chrominance, audio and pilot signals. 4,533,961, Cl. 358-315.000.
Shibata, Kiyoshi: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Yamamoto, Kiyonori; Watashi, Masahiro; Yoshinaga, Shinsuke; and Yamamoto, Toshihiko, 4,533,233, Cl. 355-8.000.
Shibata, Takashi: *See*—
Miyata, Toshihiko; and Shibata, Takashi, 4,534,057, Cl. 381-58.000.
Shields, Curtis E.: *See*—
Andrew, Wesley A.; Shields, Curtis E.; Hindlin, Harry O.; and Hamilton, Robert, 4,533,333, Cl. 441-38.000.
Shiga, Akinobu; Sasaki, Toshio; and Kojima, Junpei, to Sumitomo Chemical Company, Limited. Catalyst and process using same for producing olefin polymer. 4,533,706, Cl. 526-119.000.
Shiga, Koji, to Fuji Photo Film Co., Ltd. Sensitive material processing apparatus. 4,533,225, Cl. 354-322.000.
Shigematsu, Takashi: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; and Tokoro, Setsuo, 4,532,798, Cl. 73-116.000.
Shigenobu, Michio, to Canon Kabushiki Kaisha. Fixing device. 4,533,231, Cl. 355-3.0FU.
Shimada, Keiichiro: *See*—
Nakano, Kenji; Takahashi, Takao; Moriwaki, Hisayoshi; and Shimada, Keiichiro, 4,533,963, Cl. 360-19.100.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,532,825, Cl. 74-532.000.
Shimazaki, Hiroshi: *See*—
Ikeuchi, Satoru; Inaba, Yoshihiro; Shimazaki, Hiroshi; and Kobayashi, Tatsuhiko, 4,533,621, Cl. 430-213.000.
Shimizu, Hiroshi, to Ushio Denki Kabushiki Kaisha. Radiant heating apparatus. 4,533,820, Cl. 219-411.000.
Shimizu, Munetaka, to Copal Company Limited. Printing paper feed releasing device for printers. 4,533,270, Cl. 400-636.000.
Shimizu, Seiichi, to Canon Kabushiki Kaisha. Accessory holding device for optical instrument. 4,533,212, Cl. 350-318.000.
Shimizu, Yoshimitsu: *See*—
Maeda, Tetsuro; Okamoto, Akihiro; Shimizu, Yoshimitsu; and Nomoto, Takashi, 4,533,698, Cl. 525-73.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Itoh, Kunio; Oshima, Toshimichi; and Nakamura, Tsutomu, 4,533,687, Cl. 524-80.000.
Shinbara, Seitaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Frequency modulator wherein modulation takes place in a feedback loop of an oscillator. 4,533,882, Cl. 332-16.00T.
Shinneman, Harold C., Jr.; Rebish, Edward J.; and Shinneman, Harold C., Sr. Sharpening device. 4,532,736, Cl. 51-218.00A.
Shinneman, Harold C., Sr.: *See*—
Shinneman, Harold C., Jr.; Rebish, Edward J.; and Shinneman, Harold C., Sr., 4,532,736, Cl. 51-218.00A.
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; and Okino, Susumu, to Mitsubishi Jokogyo Kabushiki Kaisha. Exhaust fume desulfurization process. 4,533,531, Cl. 423-242.000.
Shinozaki, Satoshi: *See*—
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,532,701, Cl. 29-576.00W.
Shintani, Takashi: *See*—
Minamide, Hiroshi; Shintani, Takashi; and Murayama, Hiroshi, 4,533,525, Cl. 428-469.000.
Shioi, Shunshuke; Takekawa, Yasuo; and Miyake, Makoto, to Kanzaki Paper Manufacturing Company, Ltd. Recording materials. 4,533,930, Cl. 346-211.000.
Shionogi & Co., Ltd.: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,533,730, Cl. 544-92.000.
Shiota, Junji: *See*—
Kurachi, Hisao; Ito, Takeo; Iwase, Takayuki; and Shiota, Junji, 4,533,267, Cl. 400-214.000.
Shipley Company Inc.: *See*—
Orio, Alfred P., 4,533,445, Cl. 204-159.190.

Shirahase, Ichiro: *See*—
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Kura, Kohei; Yagi, Masahiro; and Shirahase, Ichiro, 4,533,668, Cl. 514-321.000.
Shirai, Tamenori, to Mitutoyo Mfg. Co., Ltd. Micrometer head. 4,532,711, Cl. 33-164.00R.
Shiraishi, Minoru; Numata, Yoshimi; Tano, Hiroshi; and Onaka, Tatsumi, to Hitachi Zosen Corporation. Apparatus for abrasive cleaning. 4,532,878, Cl. 114-222.000.
Shiraishi, Mitsuru: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, 4,533,554, Cl. 514-464.000.
Shoichiro, Uyeo: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,533,730, Cl. 544-92.000.
Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Yamazaki, Masamichi, 4,533,020, Cl. 184-55.200.
Shonetsugaku Kenkyusho Co., Ltd.: *See*—
Uchida, Shiichiro, 4,532,720, Cl. 34-27.000.
Showa Aluminum Corporation: *See*—
Momose, Yutaka; Yamaguchi, Kazuaki; Okamoto, Masayoshi; Hoshino, Ryoichi; and Tanaka, Hiroki, 4,532,771, Cl. 62-6.000.
Showa Denko Kabushiki Kaisha: *See*—
Kurosawa, Shigeru; and Ueshima, Takashi, 4,533,721, Cl. 528-174.000.
Shue, Roger C.: *See*—
Blair, John J.; Fonvielle, Frank P.; Smith, Richard A.; Dehoff, Barry D.; and Shue, Roger C., 4,533,325, Cl. 433-171.000.
Shumate, Daniel L.: *See*—
Gee, Gary W.; Shumate, Daniel L.; Nieder, John J.; Bump, Boyd E.; and Kource, Robert D., 4,532,815, Cl. 73-864.630.
Shumikhin, Vladimir S.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., 4,533,243, Cl. 356-44.000.
Shupert, Paul T.: *See*—
Schemelin, Michael P.; Kaminski, Tony L.; and Shupert, Paul T., 4,532,755, Cl. 56-16.600.
Sidney, LuAnn: *See*—
Evans, Jack L.; Campbell, Karen J.; Kreil, Curtis L.; and Sidney, LuAnn, 4,533,566, Cl. 427-44.000.
Siemens Aktiengesellschaft: *See*—
Fischer, Reinhard, 4,533,874, Cl. 329-50.000.
Fuchs, Peter; Mueller-Glaser, Klaus; Schuett, Dieter; and Wach, Wolfgang, 4,534,008, Cl. 364-716.000.
Grabmaier, Josef; Falckenberg, Richard; and Foll, Helmut, 4,533,428, Cl. 156-608.000.
Herget, Werner, 4,533,958, Cl. 358-280.000.
Rehm, Hans; and Breitenfeld, Horst, 4,533,878, Cl. 330-261.000.
Schlenk, Manfred, 4,533,865, Cl. 324-51.000.
Stockl, Klaus, 4,533,106, Cl. 248-421.000.
Siemens Corporate Research & Support, Inc.: *See*—
Binks, Ronald; Rehak, Anthony S.; and Sinberg, Howard, 4,533,792, Cl. 179-84.00C.
Trischler, Erwin, 4,534,028, Cl. 371-25.000.
Siemon Company, The: *See*—
Knickerbocker, Robert H., 4,533,195, Cl. 339-97.00P.
Pohl, Karl-Heinz, 4,533,202, Cl. 339-176.0MP.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Wehle, Peter, 4,533,425, Cl. 156-466.000.
Sigismonde, Michael, to Guzowski, Christopher B., a part interest. Blizzardkoat. 4,532,654, Cl. 2-69.500.
Signode Corporation: *See*—
Kobiella, Robert J., 4,533,343, Cl. 474-207.000.
Sih, John C.: *See*—
Aristoff, Paul A.; and Sih, John C., 4,533,749, Cl. 562-501.000.
Simko, Richard T., to Xicor, Inc. Integrated circuit high voltage clamping systems. 4,533,846, Cl. 307-550.000.
Simmons, Lacy W. Poultry oil sac removal method and apparatus. 4,532,676, Cl. 17-45.000.
Simplicity Manufacturing, Inc.: *See*—
Schemelin, Michael P.; Kaminski, Tony L.; and Shupert, Paul T., 4,532,755, Cl. 56-16.600.
Sims, Darrell E.: *See*—
Agius, Frank P.; and Sims, Darrell E., 4,533,284, Cl. 408-92.000.
Simson, Dionizy, to Sulzer Brothers Limited. Apparatus for collecting waste from a textile machine. 4,532,860, Cl. 100-90.000.
Sinberg, Howard: *See*—
Binks, Ronald; Rehak, Anthony S.; and Sinberg, Howard, 4,533,792, Cl. 179-84.00C.
Sincerbox, Glenn T.: *See*—
Bjorklund, Gary C.; and Sincerbox, Glenn T., 4,533,211, Cl. 350-162.120.
Sindall, John H.: *See*—
Atherton, John R.; Sindall, John H.; and Heathcock, Osmond R., 4,532,997, Cl. 169-56.000.
Singer Company, The: *See*—
Beller, Wilbert E.; Georgacakis, George D.; and Obermann, George, 4,533,803, Cl. 200-153.00K.
Singh, Shanker; and Singh, Vijendra P., to International Business Machines Corporation. Fault alignment control system and circuits. 4,534,029, Cl. 371-10.000.
Singh, Vijendra P.: *See*—
Singh, Shanker; and Singh, Vijendra P., 4,534,029, Cl. 371-10.000.
Single Buoy Moorings, Inc.: *See*—
Coppens, Anton; and Poldervaart, Leendert, 4,533,332, Cl. 441-3.000.
Sinsko, George V. Purse organizer. 4,532,972, Cl. 150-100.000.
SIP - Societa Italiana per L'Esercizio Telefonico p.A.: *See*—
Fabbri, Bruno; and Fausone, Alfredo, 4,533,868, Cl. 324-83.00R.
Sippel, David F., to General Electric Company. Method of removing a coating. 4,532,738, Cl. 51-319.000.
Sirrenberg, Wilhelm; Klauke, Erich; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. 2,5-Dihalogenobenzoyl-(thio)urea insecticides. 4,533,676, Cl. 514-535.000.
SKF Kugellagerfabriken GmbH: *See*—
Haugwitz, Werner, 4,533,264, Cl. 384-472.000.
SKF (U.K.) Limited: *See*—
Woodbridge, Keith W., 4,533,265, Cl. 384-477.000.
Skrabal, Walter F.: *See*—
Sansevero, Vincent J., Jr.; and Skrabal, Walter F., 4,533,067, Cl. 222-135.000.
SKW Trostberg Aktiengesellschaft: *See*—
Vollbrecht, Heinz-Rudiger, 4,533,733, Cl. 544-190.000.
Slade Gorton & Co., Inc.: *See*—
Wenstrom, Richard T.; and Gorton, Thomas S., Jr., 4,532,677, Cl. 17-74.000.
Slidex Corporation: *See*—
Ozeki, Jiro, 4,533,048, Cl. 206-455.000.
Ozeki, Jiro, 4,533,049, Cl. 206-455.000.
Sloan Valve Company: *See*—
Lissau, Frederic, 4,533,115, Cl. 251-142.000.
Slonicki, Alex. Foot scrubber with soap dispenser for user who cannot reach his feet. 4,532,668, Cl. 15-104.920.
Slyman Manufacturing Corporation: *See*—
Buehl, Arnold L., 4,533,318, Cl. 431-328.000.
Small, Hamish: *See*—
Miller, Theodore E., Jr.; and Small, Hamish, 4,532,811, Cl. 73-861.050.
Smith, Alan; and Bailey, Peter J., to Glaxo Group Limited. Production of a cephalosporin by fermentation. 4,533,632, Cl. 435-47.000.
Smith, Alexander B.: *See*—
Martens, George D.; Smith, Alexander B.; and Healy, Thomas D., 4,532,796, Cl. 73-632.000.
Smith, Charles W., Jr., to Autoclave Engineers, Inc. Rapid cool autoclave furnace. 4,532,984, Cl. 165-61.000.
Smith, Clinton R.: *See*—
Henderson, Harry E.; and Smith, Clinton R., 4,533,778, Cl. 585-13.000.
Smith, David B.; Miller, Randolph F.; and Moore, John M., to Precor Incorporated. Pedal-operated, stationary exercise device. 4,533,136, Cl. 272-73.000.
Smith, Howard W., to United States of America, Air Force. X-ray goniometer. 4,534,050, Cl. 378-81.000.
Smith International, Inc.: *See*—
Ecer, Gunes M., 4,533,815, Cl. 219-121.0LF.
Smith, J. Thomas: *See*—
French, Kenneth; Kocher, Robert C.; Piorkow, Alfred; Shaner, Kenneth; and Smith, J. Thomas, 4,533,251, Cl. 356-384.000.
Smith, Kendall A., to Technicare Corporation. Adaptable area for image storage. 4,533,947, Cl. 358-111.000.
Smith, Michael J.; and Soucie, Allen L., to Linatex Corporation of America. Teeter bed zone density control device and method. 4,533,464, Cl. 209-158.000.
Smith, Philip C., to Westinghouse Electric Corp. Device structures for high density integrated circuits. 4,533,934, Cl. 357-23.700.
Smith, Richard A.: *See*—
Blair, John J.; Fonvielle, Frank P.; Smith, Richard A.; Dehoff, Barry D.; and Shue, Roger C., 4,533,325, Cl. 433-171.000.
Smith, Thomas J., to TII Industries, Inc. Shorting cage for protector wells. 4,533,971, Cl. 361-119.000.
Smith, William V., to Discovision Associates. Angularly multiplexed optical recording medium. 4,534,021, Cl. 369-47.000.
SmithKline Beckman Corporation: *See*—
Gleason, John G.; Hall, Ralph F.; and Ku, Thomas W., 4,533,747, Cl. 560-152.000.
Smolen, Victor F.: *See*—
Cosgrove, Robert J., Jr.; and Smolen, Victor F., 4,533,346, Cl. 604-66.000.
Smyth, Donald N., to Sabco Limited. Brush with detergent feed. 4,532,666, Cl. 15-22.00R.
Snaddon, Robert W. L.; and Dietz, Peter W., to Black & Decker, Inc. Apparatus for removing respirable aerosols from air. 4,533,368, Cl. 55-104.000.
Snider, Joel M.: *See*—
Mueller, Dale E.; and Snider, Joel M., 4,533,126, Cl. 267-141.000.
Societe Anonyme D.B.A.: *See*—
Carre, Jean-Jacques; Courbot, Pierre; and Mery, Jean-Claude, 4,533,023, Cl. 188-73.340.
Carre , Jean-Jacques, 4,533,025, Cl. 188-73.440.
Societe Anonyme de Telecommunications: *See*—
Bourdillot, Michel; Gauthier, Andre ; Maille , Jacques; and Pitault, Bernard, 4,532,699, Cl. 29-572.000.
S.A. Des Ateliers, Houget Duesberg Bosson: *See*—
Kunig, Helmut, 4,532,678, Cl. 19-129.00R.
Societe ECA: *See*—
Lauvray, Georges R. P. L.; and Darche, Michel J. P., 4,533,945, Cl. 358-109.000.

Societe Nationale Elf-Aquitaine (Production): *See*—
Chauvin, Yves; Commereuc, Dominique; Hirschauer, Andre ; Reffet, Dominique; and Stern, Robert, 4,533,500, Cl. 260-404.000.
Societe Nationale Industrielle Aerospatiale: *See*—
Coffy, Rene L., 4,532,889, Cl. 118-718.000.
Societe Nationale Industrielle et Aerospatiale: *See*—
Paseri, Jacques, 4,533,100, Cl. 244-158.00R.
Societe Parisienne D'Impression et de Cartonnage: *See*—
Chazal, Guy A.; and Bodet, Jean A., 4,533,065, Cl. 220-462.000.
Societe Staubli-Verdol: *See*—
Bastion, Patrick; Lhuillier, Francois; and Mutschler, Ulrich, 4,532,963, Cl. 139-59.000.
Soderkvist, Anton, to LKB-Produkter AB. Method in a microtome for creating the possibility that the slit between the knife edge and the specimen can be made extremely narrow. 4,532,838, Cl. 83-13.000.
Sola, Domenico: *See*—
Minucciani, Giorgio; and Sola, Domenico, 4,534,006, Cl. 364-513.000.
Solis S.r.l.: *See*—
Gazzarrini, Vinicio, 4,532,875, Cl. 112-262.200.
Sollich, Helmut. Tunnel for refrigerating, heating, or drying products of the foodstuffs and especially the confectionery industry. 4,532,857, Cl. 99-483.000.
Solordal, Steinar, to A/S Tomra Systems. Method for identification of metal boxes or cans and an apparatus for carrying out said method. 4,532,859, Cl. 100-35.000.
Sommer, Edward J., Jr.; Kenny, Garry R.; and Roos, Charles E., to Magnetic Separation Systems, Inc. Rotary fuel homogenizer and use thereof. 4,533,054, Cl. 209-687.000.
Sommer, Edward J., Jr.: *See*—
Kenny, Garry R.; Sommer, Edward J., Jr.; and Roos, Charles E., 4,533,053, Cl. 209-636.000.
Somorjai, Gabor A.; and Leygraf, Christofer H., to University of California, The Regents of The. Electrolytic photodissociation of chemical compounds by iron oxide photochemical diodes. 4,533,608, Cl. 429-111.000.
Sone, Takanori: *See*—
Ibuki, Tadayuki; Sugihara, Taisuke; Kawakubo, Hiromu; and Sone, Takanori, 4,533,731, Cl. 544-140.000.
Soneda, Mitsuo; and Maekawa, Toshikazu, to Sony Corporation. Solid state image pickup apparatus. 4,533,954, Cl. 358-212.000.
Sonne, Leonard J., to HealthScan Inc. Pulmonary training method. 4,533,137, Cl. 272-99.000.
Sonnenberg, Gary N.: *See*—
Borgmeyer, Virgil L.; Galloway, Dudley L.; Sonnenberg, Gary N.; Gruczka, Jan S.; and Owen, Timothy C., 4,533,786, Cl. 174-50.000.
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Fujimura, Naoto; Sonobe, Akihiro; Yoshihara, Toshiyuki; Takebayashi, Norie; Tanaka, Takashi; and Kuribayashi, Masaki, 4,533,232, Cl. 355-3.00R.
Sony Corporation: *See*—
Fujimura, Yasushi; Okada, Takashi; and Yamagiwa, Kazuo, 4,533,949, Cl. 358-122.000.
Miyashita, Takao; and Sato, Toshio, 4,533,969, Cl. 360-132.000.
Miyata, Toshihiko; and Shibata, Takashi, 4,534,057, Cl. 381-58.000.
Nakano, Kenji; Takahashi, Takao; Moriwaki, Hisayoshi; and Shimada, Keiichiro, 4,533,963, Cl. 360-19.100.
Nakazato, Kunio; and Ozawa, Kazuya, 4,533,218, Cl. 350-430.000.
Ohkoshi, Akio; Toyama, Takashi; and Watanabe, Toshiro, 4,533,850, Cl. 313-36.000.
Soneda, Mitsuo; and Maekawa, Toshikazu, 4,533,954, Cl. 358-212.000.
Yamada, Takaaki; and Sekino, Takeo, 4,533,903, Cl. 340-347.0AD.
Yamamoto, Kaichi; and Yonemitsu, Jun, 4,533,937, Cl. 358-22.000.
Sorbo, Peter J.: *See*—
Roule, Richard L.; Sorbo, Peter J.; and Kimball, John J., 4,533,586, Cl. 428-137.000.
Sorko-Ram, Paul O. Process for producing a device for reflecting electromagnetic energy and product produced thereby. 4,533,591, Cl. 428-213.000.
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Smith, Michael J.; and Soucie, Allen L., 4,533,464, Cl. 209-158.000.
Spalding, Peter S., to Alcan Aluminun Corporation. Liquid flow switch and method of using same. 4,533,802, Cl. 200-81.90R.
Spector, George: *See*—
Trejo, Jesse; and Spector, George, 4,532,725, Cl. 37-243.000.
Speldrich, Werner: *See*—
Morz, Gunter; and Speldrich, Werner, 4,533,887, Cl. 333-256.000.
Spencer, Alwyn, to Ciba-Geigy Corporation. Process for the preparation of styrene derivatives and/or stilbene derivatives. 4,533,505, Cl. 260-465.00R.
Sperry Corporation: *See*—
Lucchi, George A.; and Alisobhani, Jalal, 4,533,915, Cl. 343-5.00W.
Sheppard, John E., 4,533,624, Cl. 430-312.000.
Spielau, Paul: *See*—
Neuschaeffer, Karl H.; Spielau, Paul; Zoche, Gunter; and Engels, Hans-Werner, 4,533,393, Cl. 106-18.120.
Spinner, Joseph R., to King-Seeley Thermos Co. Ice making apparatus. 4,533,310, Cl. 425-376.00R.
Spinning, Richard R. Adjustable radial curve. 4,532,714, Cl. 33-177.000.
Sponseller, David L.; and Straatmann, John A., to AMAX Inc. Tubular high strength low alloy steel for oil and gas wells. 4,533,405, Cl. 148-36.000.
Spott, Georg: *See*—
Goldmann, Gerd; Spott, Georg; and Frohlich, Christian, 4,533,432, Cl. 159-47.100.
Sprague Electric Company: *See*—
Hebert, John R., Jr., 4,533,989, Cl. 363-132.000.
Maher, Galeb H., 4,533,974, Cl. 361-320.000.
Sprinter System AB: *See*—
Persson, Karl R., 4,533,079, Cl. 229-31.00R.
Spry, Douglas O., to Eli Lilly and Company. N-ethylidene azetidinones. 4,533,497, Cl. 260-239.00A.
Squire, Edward N., to Du Pont de Nemours, E. I., and Company. 4,5-Dichloro-2,2,4,5,-tetrafluoro-1,3-dioxolane. 4,533,741, Cl. 549-455.000.
Squires, V. Alan, to Cooper Industries, Inc. Wedge lock valve retainer. 4,532,955, Cl. 137-15.000.
SRI International: *See*—
Wolfe, James F.; Sybert, Paul D.; and Sybert, Joanne R., 4,533,692, Cl. 524-417.000.
Wolfe, James F.; Sybert, Paul D.; and Sybert, Joanne R., 4,533,693, Cl. 524-417.000.
Wolfe, James F.; Sybert, Paul D.; and Wilson, Blake, 4,533,724, Cl. 528-313.000.
Srivastava, Suresh C.; Meinken, George E.; and Richards, Powell, to United States of America, Energy. Tin-117m-labeled stannic (Sn^{4+}) chelates. 4,533,541, Cl. 424-1.100.
Stackhouse, James L., Jr., to Emerson Electric Co. Saw blade guard. 4,532,841, Cl. 83-102.100.
Staerzl, Richard E., to Brunswick Corporation. Binary and proportional control for a feedback carburetor. 4,532,903, Cl. 123-436.000.
Stamicarbon B.V.: *See*—
Schrijver, Jan; and Vossebeld, Arnold, 4,533,696, Cl. 524-528.000.
Standard Oil Company, The: *See*—
Fox, Joseph R.; Pesa, Frederick A.; and Curatolo, Benedict S., 4,533,775, Cl. 568-905.000.
Lee, Min-Hsiun, 4,533,529, Cl. 423-230.000.
Standard Oil Company (Indiana): *See*—
Fields, Ellis K., 4,533,478, Cl. 252-8.55D.
Hoekstra, George R.; and Forgac, John M., 4,532,991, Cl. 166-261.000.
Stangroom, James E., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Fluid-powered actuators. 4,532,853, Cl. 91-165.000.
Starmuhler, Erwin: *See*—
Muhlberger, Heinz; Starmuhler, Erwin; Weishaupt, Walter; Flohr, Peter; and Bourauel, Fritz, 4,533,900, Cl. 340-52.00R.
Stauffer Chemical Company: *See*—
Burks, William M., Jr.; Doane, Elliott P.; Campbell, Ramsey G.; and Velez, Emilio S., 4,533,473, Cl. 210-754.000.
Stavis, Hillel: *See*—
Bell, George M., 4,533,104, Cl. 248-245.000.
Ste Francaise des Produits pour Catalyse chez Institut Francais du Petrole: *See*—
Boitiaux, Jean-Paul; and Oosyns, Jean, 4,533,779, Cl. 585-259.000.
Ste LOOK: *See*—
Bernard, Jean; Beyl, Jean J. A.; Campillo, Christian; and Le Faou, Daniel, 4,533,154, Cl. 280-615.000.
Stearns, William P.: *See*—
Penz, Perry A.; Petcavich, Robert J.; Stearns, William P.; and Sanders, Larry W., 4,533,214, Cl. 350-334.000.
Stein, Patrick G. Toothbrush holder and preserver. 4,533,045, Cl. 206-362.300.
Steinbaugh, Gary, to General Signal Corporation. Magnetic read/write circuit. 4,533,965, Cl. 360-62.000.
Steinbrenner, Ulrich, to Robert Bosch GmbH. Control device for metering fuel in a supercharged internal combustion engine. 4,532,908, Cl. 123-493.000.
Steiner, Rudolph, to Parlec, Inc. Tool presetting device with tapered air spindle mount. 4,532,716, Cl. 33-201.000.
Steinman, LeRoy F., Jr. Combination smoke and burglar alarm. 4,533,904, Cl. 340-521.000.
Stelco Inc.: *See*—
Kelly, John H., 4,533,642, Cl. 436-78.000.
Stenzel, Gerhard: *See*—
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,533,244, Cl. 356-71.000.
Sterki, Armin, to Maag Gear-Wheel & Machine Company, Ltd. Inspection machine and method for measuring the circular pitch spacing of teeth on a measurement circle of a gear. 4,532,715, Cl. 33-179.50R.
Sterling Drug Inc.: *See*—
Morgan, Barry A., 4,533,655, Cl. 514-18.000.
Morgan, Barry A., 4,533,657, Cl. 514-19.000.
Stern, Robert: *See*—
Chauvin, Yves; Commereuc, Dominique; Hirschauer, Andre ; Reffet, Dominique; and Stern, Robert, 4,533,500, Cl. 260-404.000.
Sterrett, Terry L.: *See*—
Kidd, Patrick D.; Sterrett, Terry L.; and Andreiko, Craig A., 4,533,321, Cl. 433-18.000.
Stevens, Rex R., to Dow Chemical Company, The. Metal oxide fibers from acrylate salts. 4,533,508, Cl. 264-22.000.
Steward, John H.; and Ladouceur, Harold A., to Multifastener Corporation. Fastener orienting, tapping and collection system. 4,532,664, Cl. 10-162.00A.
Stewart, Allan: *See*—
Dewing, John; Hogan, Philip J.; and Stewart, Allan, 4,533,533, Cl. 423-328.000.

Stewart, Keith. Kite. 4,533,099, Cl. 244-153.00R.
Stidham, Mark A., to Atwood Vacuum Machine Company. Swivel. 4,533,276, Cl. 403-165.000.
Stirling Thermal Motors, Inc.: *See*—
Meijer, Roelf J.; Ziph, Benjamine; and Godett, Ted M., 4,532,855, Cl. 92-71.000.
Stockburger, Hermann; Winderlich, Hans-George; Bauer, Siegfried; and Adamovic, Zeljko H. Method and device for registering the use of copying machines. 4,533,237, Cl. 355-40.000.
Stockl, Klaus, to Siemens Aktiengesellschaft. Lifting device for a dentist chair. 4,533,106, Cl. 248-421.000.
Stokes, Vijay K., to General Electric Company. Double beam motor vehicle bumpers. 4,533,166, Cl. 293-120.000.
Stomp, Hubert: *See*—
Mailliet, Pierre; Andonov, Radomir; Stomp, Hubert; and Monai, Jean, 4,533,125, Cl. 266-226.000.
Stone Manufacturing & Supply Co.: *See*—
Allen, Gary D., 4,532,707, Cl. 30-200.000.
Stops, Peter: *See*—
Kummer, Rudolf; Richter, Wolfgang; Schwirten, Kurt; and Stops, Peter, 4,533,757, Cl. 568-454.000.
Storage Technology Corporation: *See*—
Georgis, Steven P., 4,533,991, Cl. 364-164.000.
Stowe, David W., to Gould Inc. Evanescent-wave star coupler on a substrate. 4,533,208, Cl. 350-96.160.
Straatmann, John A.: *See*—
Sponseller, David L.; and Straatmann, John A., 4,533,405, Cl. 148-36.000.
Strapex AG: *See*—
Kuhnert, Volker; and Niedrig, Franklin, 4,533,046, Cl. 206-389.000.
Strata Bit Corporation: *See*—
Morris, Wilford V., 4,533,005, Cl. 175-393.000.
Straub, Richard L.: *See*—
Pou, Frederick M.; and Straub, Richard L., 4,533,269, Cl. 400-582.000.
Strole, Ulrich: *See*—
Witter, Karl-Theo; Friedrich, Peter; and Strole, Ulrich, 4,533,515, Cl. 422-26.000.
Sturdy, Harry D., to Sturdy Truck Equipment, Inc. Engine governor with fast reference positioning and slow opening and closing movement of throttle limiter. 4,532,901, Cl. 123-333.000.
Sturdy Truck Equipment, Inc.: *See*—
Sturdy, Harry D., 4,532,901, Cl. 123-333.000.
Suematsu, Koushi: *See*—
Ohsaki, Ichiro; Hasegawa, Tetsuo; and Suematsu, Koushi, 4,533,616, Cl. 430-110.000.
Sugano, Kazuhiko, to Nissan Motor Company, Ltd. Hydraulic control system for automatic transmission. 4,532,829, Cl. 74-869.000.
Sugawara, Koko: *See*—
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,533,631, Cl. 435-70.000.
Sugihara, Masahiro; Morishita, Etsuo; Hirai, Tetsuo; and Sekiya, Shin, to Mitsubishi Denki Kabushiki Kaisha. Turbine rotatable in one direction in a reciprocating flow. 4,533,292, Cl. 415-2.00R.
Sugihara, Taisuke: *See*—
Ibuki, Tadayuki; Sugihara, Taisuke; Kawakubo, Hiromu; and Sone, Takanori, 4,533,731, Cl. 544-140.000.
Sugisaki, Mutsuo: *See*—
Itoh, Kazuhiro; Sugisaki, Mutsuo; and Tanaka, Hiroshi, 4,532,685, Cl. 29-156.40R.
Sugiura, Susumu; and Kohzato, Yasuo, to Canon Kabushiki Kaisha. Color image processing apparatus. 4,533,928, Cl. 346-140.00R.
Sugiyama, Masahiko: *See*—
Hashimoto, Kametaro; Ushitani, Kenji; Noda, Fumiyoshi; Sugiyama, Masahiko; and Murachi, Mikio, 4,533,579, Cl. 428-36.000.
Sugiyama, Shizuo: *See*—
Kobayashi, Masahito; Maeda, Narimichi; Hagiwara, Yoshimune; Akazawa, Takashi; and Sugiyama, Shizuo, 4,534,010, Cl. 364-748.000.
Sukonick, Josef; and Fjallstam, Bjorn M., to Cadtrak Corporation. Graphics display system with viewports of arbitrary location and content. 4,533,910, Cl. 340-721.000.
Sulzer Brothers Limited: *See*—
Lincke, Paul, 4,532,965, Cl. 139-435.000.
Simson, Dionizy, 4,532,860, Cl. 100-90.000.
Sumitomo Chemical Company, Limited: *See*—
Shiga, Akinobu; Sasaki, Toshio; and Kojima, Junpei, 4,533,706, Cl. 526-119.000.
Sumitomo Electric Industries, Ltd.: *See*—
Okita, Koichi, 4,533,369, Cl. 55-158.000.
Suncom, Incorporated: *See*—
Cecchi, Marino; Borucki, Gregory J.; and Happ, Lawrence R., 4,533,092, Cl. 242-186.000.
Sundstrand Corporation: *See*—
Aldrich, Allyn M., 4,533,097, Cl. 244-78.000.
Sung, Rodney L.; and Karol, Thomas J., to Texaco Inc. Middle distillate containing storage stability additive. 4,533,361, Cl. 44-73.000.
Susman, Samuel E.: *See*—
Hirschbuehler, Kevin; and Susman, Samuel E., 4,533,686, Cl. 523-468.000.
Suter, Walter. Apparatus for folding a running web with folding roller and adjustable parallelling bar. 4,533,130, Cl. 270-41.000.
Suwa, Kaname, to Canon Kabushiki Kaisha. Electronic unit. 4,533,976, Cl. 361-395.000.
Suzuki, Eiichi, to Canon Kabushiki Kaisha. Ink-jet recording method. 4,533,920, Cl. 346-1.100.
Suzuki, Eiichi, to Canon Kabushiki Kaisha. Ink-jet recording method. 4,533,923, Cl. 346-1.100.
Suzuki, Hirohisa: *See*—
Ono, Shigetoshi; Harada, Toru; Suzuki, Hirohisa; Tanaka, Mitsugu; and Nakamura, Shigeru, 4,533,626, Cl. 430-562.000.
Suzuki, Kohji: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,533,453, Cl. 204-252.000.
Suzuki, Noboru: *See*—
Hakuraku, Yoshinori; Ogata, Hisanao; Daikoku, Takahiro; and Suzuki, Noboru, 4,532,770, Cl. 62-3.000.
Suzuki, Tokuo. Pocket structure in a sock or the like. 4,532,656, Cl. 2-247.000.
Swain, James C.; and Thomas, David L., to Diesel Kiki Co., Ltd. Variable capacity wobble plate compressor with prompt capacity control. 4,533,299, Cl. 417-222.000.
Swain, Thomas L., to Monolithic Memories, Inc. Integrated circuit package magazine and receptacle. 4,533,043, Cl. 206-328.000.
Sweetman, James E.: *See*—
Miller, Alexander; Sweetman, James E.; and McDougall, Douglas J., 4,532,743, Cl. 52-207.000.
Sybert, Joanne R.: *See*—
Wolfe, James F.; Sybert, Paul D.; and Sybert, Joanne R., 4,533,692, Cl. 524-417.000.
Wolfe, James F.; Sybert, Paul D.; and Sybert, Joanne R., 4,533,693, Cl. 524-417.000.
Sybert, Paul D.: *See*—
Wolfe, James F.; Sybert, Paul D.; and Sybert, Joanne R., 4,533,692, Cl. 524-417.000.
Wolfe, James F.; Sybert, Paul D.; and Sybert, Joanne R., 4,533,693, Cl. 524-417.000.
Wolfe, James F.; Sybert, Paul D.; and Wilson, Blake, 4,533,724, Cl. 528-313.000.
Sybron Corporation: *See*—
Kidd, Patrick D.; Sterrett, Terry L.; and Andreiko, Craig A., 4,533,321, Cl. 433-18.000.
Sygnator, Henry A., to Illinois Tool Works Inc. Method of manufacturing a drill screw. 4,532,663, Cl. 10-10.00R.
Syrier, Johannes L. M.: *See*—
van Helden, Robert; Baardman, Frank; and Syrier, Johannes L. M., 4,533,379, Cl. 71-88.000.
Syva Company: *See*—
Litman, David J.; and Ullman, Edwin F., 4,533,629, Cl. 435-7.000.
Szczepanski, Henry, to Ciba-Geigy Corporation. Oxime derivatives for protecting plant crops. 4,532,732, Cl. 47-57.600.
Szerdahelyi, Lajos: *See*—
Muranyi, Istvan; Balazs, Laszlone ; Molnar, Jozsef; Burda, Ferencne ; Metzler, Maria; and Szerdahelyi, Lajos, 4,533,638, Cl. 435-288.000.
T. O. Plastics, Inc.: *See*—
Kraft, Howard R., 4,533,588, Cl. 428-167.000.
Taff, Douglas C.; and Holdridge, Robert B. Modular passive solar energy heating unit employing phase change heat storage material which is clearly transparent when in its high-stored-energy liquid state. 4,532,917, Cl. 126-430.000.
Tagata, Nobuo: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,533,711, Cl. 526-340.400.
Taig, Alistair G., to Allied Corporation. Mechanical brake control device. 4,533,028, Cl. 192-13.00A.
Taka, Hideo: *See*—
Masunaga, Makoto; and Taka, Hideo, 4,533,241, Cl. 356-1.000.
Takada, Isao: *See*—
Kawasaki, Tatsuo; Takada, Isao; and Ohtsubo, Hiroshi, 4,533,806, Cl. 219-8.500.
Takada, Keisuke; and Okuhara, Hiroo, to Tokyo Shibaura Denki Kabushiki Kaisha. Computer process control system. 4,533,990, Cl. 364-160.000.
Takahashi, Akira, to Ricoh Company, Ltd. Distance measuring circuit. 4,533,227, Cl. 354-403.000.
Takahashi, Hitoshi: *See*—
Takaishi, Naotake; Takahashi, Hitoshi; and Inamoto, Yoshiaki, 4,533,770, Cl. 568-817.000.
Takahashi, Katsuhiko: *See*—
Kasuga, Takuzo; and Takahashi, Katsuhiko, 4,533,680, Cl. 523-220.000.
Takahashi, Masahiro: *See*—
Oda, Kazutaka; Ohba, Hisao; Miyashita, Teruo; Morita, Akira; and Takahashi, Masahiro, 4,533,444, Cl. 204-129.430.
Takahashi, Osamu; and Tanaka, Mitsugu, to Fuji Photo Film Co., Ltd. Photographic element for color diffusion transfer process containing hydroquinone sulfonates. 4,533,622, Cl. 430-218.000.
Takahashi, Shunetsu, to Epson Corporation. Mechanism for selecting pen in an X-Y plotter. 4,533,924, Cl. 346-49.000.
Takahashi, Takao: *See*—
Nakano, Kenji; Takahashi, Takao; Moriwaki, Hisayoshi; and Shimada, Keiichiro, 4,533,963, Cl. 360-19.100.
Takaishi, Naotake; Takahashi, Hitoshi; and Inamoto, Yoshiaki, to Kao Corporation. 2-Exo-hydroxy-endo-tricyclo[6.2.1.0^{2,7}]undecane. 4,533,770, Cl. 568-817.000.
Takaoka, Hiroshi; Furukawa, Toshiki; and Fukuda, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Load control system and method of combined cycle turbine plants. 4,532,761, Cl. 60-39.130.

Takase, Hiroshi: *See*—
Kurita, Hiroyuki; Kobayashi, Yuko; Dosaka, Shinichi; Kikuchi, Juro; Takase, Hiroshi; and Harada, Kenichi, 4,533,220, Cl. 350-507.000.

Takashima, Hiroaki: *See*—
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Katoh, Osamu, 4,533,535, Cl. 423-447.400.

Takashima, Yoshie: *See*—
Yamamoto, Michiyoshi; Ohsumi, Katsumi; Mitani, Shinji; Takashima, Yoshie; and Igarashi, Hiroo, 4,533,514, Cl. 376-308.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, 4,533,738, Cl. 548-194.000.

Takaya, Takao; Inoue, Yoshikazu; Murata, Masayoshi; and Takasugi, Hisashi, to Fujisawa Pharmaceutical Co., Ltd. New cephem compounds and processes for preparation thereof. 4,533,738, Cl. 548-194.000.

Take, Shigeo: *See*—
Asaumi, Hiroshi; Take, Shigeo; Akase, Masazumi; and Terada, Isao, 4,533,581, Cl. 428-64.000.

Takebayashi, Norie: *See*—
Fujimura, Naoto; Sonobe, Akihiro; Yoshihara, Toshiyuki; Takebayashi, Norie; Tanaka, Takashi; and Kuribayashi, Masaki, 4,533,232, Cl. 355-3.00R.

Takeda Chemical Industries, Ltd.: *See*—
Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, 4,533,554, Cl. 514-464.000.
Yoshioka, Kouichi; and Ochiai, Michihiko, 4,533,495, Cl. 260-239.00A.

Takeda, Kunihiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Basic compound, its polymer, a process for the preparation thereof and its use as ion exchange resin. 4,533,678, Cl. 521-389.000.

Takeda, Masami: *See*—
Mizui, Kinya; Takeda, Masami; and Iwata, Tadao, 4,533,700, Cl. 525-285.000.

Takeda, Yoshio: *See*—
Washizuka, Isamu; and Takeda, Yoshio, 4,533,213, Cl. 350-332.000.

Takekawa, Yasuo: *See*—
Shioi, Shunshuke; Takekawa, Yasuo; and Miyake, Makoto, 4,533,930, Cl. 346-211.000.

Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, to Bridgestone Tire Company Limited; and Japan Synthetic Rubber Co., Ltd. Polybutadiene rubber compositions having improved green strength. 4,533,711, Cl. 526-340.400.

Takeuchi, Yukihisa; and Fujita, Tadashi, to NGK Insulators, Ltd. Multi-channel body. 4,533,584, Cl. 428-116.000.

Takino, Kenichi; Yamasaki, Eiji; and Murakami, Kenji, to Sharp Kabushiki Kaisha. Vaporizing type fuel combustion apparatus with tar removal device. 4,533,316, Cl. 431-32.000.

Takino, Shigekatsu: *See*—
Kondo, Hirokazu; and Takino, Shigekatsu, 4,532,869, Cl. 104-166.000.

Talley, John J., to General Electric Company. Catalytic hydrodealkylation of alkylated phenols. 4,533,767, Cl. 568-805.000.

Talley, John J., to General Electric Company. Zinc oxide catalyzed dealkylation of alkylated phenols. 4,533,768, Cl. 568-805.000.

Talley, John J., to General Electric Company. Method of making methylated phenol from methylated cyclohexeneone. 4,533,769, Cl. 568-806.000.

Tanahashi, Toshifumi; and Itoh, Senji, to Toyo Seikan Kaisha Limited. Composite material for packaging containers. 4,533,576, Cl. 428-35.000.

Tanaka, Haruhiko: *See*—
Kongoh, Takeshi; and Tanaka, Haruhiko, 4,532,876, Cl. 112-454.000.

Tanaka, Hideto, to Alps Electric Co., Ltd. Linearly parallel multipen recorder. 4,533,922, Cl. 346-1.100.

Tanaka, Hiroki: *See*—
Momose, Yutaka; Yamaguchi, Kazuaki; Okamoto, Masayoshi; Hoshino, Ryoichi; and Tanaka, Hiroki, 4,532,771, Cl. 62-6.000.

Tanaka, Hiroshi: *See*—
Itoh, Kazuhiro; Sugisaki, Mutsuo; and Tanaka, Hiroshi, 4,532,685, Cl. 29-156.40R.

Tanaka, Masami: *See*—
Fukui, Masahiro; Kitano, Kisei; Tanaka, Masami; and Goto, Yasuyuki, 4,533,488, Cl. 252-299.610.

Tanaka, Mitsugu: *See*—
Ono, Shigetoshi; Harada, Toru; Suzuki, Hirohisa; Tanaka, Mitsugu; and Nakamura, Shigeru, 4,533,626, Cl. 430-562.000.
Takahashi, Osamu; and Tanaka, Mitsugu, 4,533,622, Cl. 430-218.000.

Tanaka, Motoaki; Toyama, Takanori; Oba, Hitoshi; and Yamaguchi, Osamu, to Wako Pure Chemical Industries, Ltd. Azo polymerization initiator composition. 4,533,652, Cl. 502-167.000.

Tanaka, Shinichi; and Mineyama, Takitsugu, to Sharp Kabushiki Kaisha. Keyboard-equipped apparatus such as an electronic calculator with battery throw means for enabling a power supply circuit. 4,533,837, Cl. 307-116.000.

Tanaka, Takashi: *See*—
Fujimura, Naoto; Sonobe, Akihiro; Yoshihara, Toshiyuki; Takebayashi, Norie; Tanaka, Takashi; and Kuribayashi, Masaki, 4,533,232, Cl. 355-3.00R.

Tanaka, Yoshikazu: *See*—
Abo, Keiju; Yamamuro, Sigeaki; Tanaka, Yoshikazu; Kumura, Haruyoshi; and Hirano, Hiroyuki, 4,533,340, Cl. 474-28.000.

Tanaka, Yoshio; Nishikawa, Yasuhisa; Hasumi, Ryoichi; and Koizumi, Takashi, to Clarion Co., Ltd. Clutch interlocking mechanism. 4,532,818, Cl. 74-10.330.

Taniguchi, Isoji; Kimura, Yoshiharu; and Ichimura, Toshiaki, to Idemitsu Kosan Company Limited. Process for the production of high molecular weight organoaluminum polymers. 4,533,712, Cl. 528-9.000.

Tano, Hiroshi: *See*—
Shiraishi, Minoru; Numata, Yoshimi; Tano, Hiroshi; and Onaka, Tatsumi, 4,532,878, Cl. 114-222.000.

Tao, Thomas, to James River-Dixie/Northern, Inc. Fiber moisture control in the formation of dry-laid webs. 4,533,507, Cl. 261-153.000.

Tarpley, Robert S.: *See*—
Dyer, Richard J.; and Tarpley, Robert S., 4,532,880, Cl. 114-298.000.

Tasset, Emmett L.: *See*—
Ishibe, Nobuyuki; Thomas, Renard L.; and Tasset, Emmett L., 4,533,653, Cl. 502-242.000.

Tatani, Atsushi: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; and Okino, Susumu, 4,533,531, Cl. 423-242.000.

Tayama, Suehiro; and Kusakawa, Norihisa, to Mitsubishi Rayon Company, Limited. Flame resistant acrylic resin composition and process for its production. 4,533,689, Cl. 524-130.000.

Tayco Developments, Inc.: *See*—
Taylor, Douglas P., 4,532,856, Cl. 92-168.000.

Taylor, Douglas P., to Tayco Developments, Inc. End cap for fluid cylinder. 4,532,856, Cl. 92-168.000.

Taylor, James E.: *See*—
Dahlgren, Harold P.; Taylor, James E.; Peters, Dwight W.; and Selby, Donald R., 4,532,735, Cl. 51-56.00R.
Dahlgren, Harold P.; Gardiner, John W.; and Taylor, James E., 4,533,563, Cl. 427-387.000.

Taylor, Monroe F., to W. R. Grace & Co., Cryovac Div. Product indexing device. 4,532,752, Cl. 53-451.000.

Taylor, Philip A.: *See*—
Johnson, A. Neil; and Taylor, Philip A., 4,533,423, Cl. 156-359.000.

TDK Electronics Co., Ltd.: *See*—
Fukuda, Kazumasa; and Kitahara, Yoshimi, 4,533,603, Cl. 428-458.000.

Technicare Corporation: *See*—
Smith, Kendall A., 4,533,947, Cl. 358-111.000.

Tektronix, Inc.: *See*—
Collier, Warren, 4,534,045, Cl. 377-16.000.
Easton, Thomas C., 4,532,839, Cl. 83-29.000.
Rogers, Jerrold J.; and Trumps, Joseph S., 4,533,861, Cl. 318-696.000.

Telectronics Pty. Ltd.: *See*—
Daly, Christopher N.; and Money, David K., 4,533,988, Cl. 363-127.000.

Telefonbau und Normalzeit GmbH: *See*—
Geppert, Fritz, 4,533,793, Cl. 179-99.00R.

Teng, Yu-Ling; McCoy, Charles; DeFalco, Francis; and Mayernick, Richard, to Kollmorgan Technologies Corp. Electrodeposition composition, process for providing a Zn/Si/P coating on metal substrates and articles so coated. 4,533,606, Cl. 428-658.000.

Terada, Isao: *See*—
Asaumi, Hiroshi; Take, Shigeo; Akase, Masazumi; and Terada, Isao, 4,533,581, Cl. 428-64.000.

Terao, Shinji; Shiraishi, Mitsuru; and Kato, Kaneyoshi, to Takeda Chemical Industries, Ltd. Quinone derivatives and use. 4,533,554, Cl. 514-464.000.

Texaco Canada Resources Ltd.: *See*—
Toma, Petre; Redford, David A.; Livesey, Declan B.; and Coates, Roy M., 4,532,994, Cl. 166-303.000.

Texaco Development Corporation: *See*—
Jahnke, Frederick C.; and Crouch, William B., 4,533,363, Cl. 48-197.00R.

Texaco Inc.: *See*—
Haag, James W., 4,533,374, Cl. 62-18.000.
Lin, Jiang-Jen; and Knifton, John F., 4,533,742, Cl. 549-475.000.
Lin, Jiang-Jen; and Brader, Walter H., Jr., 4,533,756, Cl. 568-454.000.
Mims, Donald S.; and Widmyer, Richard H., 4,532,986, Cl. 166-50.000.
Rundell, Herbert A., 4,533,162, Cl. 285-27.000.
Sung, Rodney L.; and Karol, Thomas J., 4,533,361, Cl. 44-73.000.
Waddill, Harold G., 4,533,719, Cl. 528-111.000.

Texas A&M University: *See*—
Fincher, Jeffrey L., 4,533,827, Cl. 250-211.00K.

Texas Instruments Incorporated: *See*—
Grenier, Aime J.; and McBride, Lyle E., 4,533,888, Cl. 335-131.000.
Magar, Surendar S.; and Caudel, Edward R., 4,533,992, Cl. 364-200.000.
McAlexander, Joseph C., III; White, Lionel S., Jr.; and Mohan Rao, G. R., 4,533,843, Cl. 307-530.000.
Penz, Perry A.; Petcavich, Robert J.; Stearns, William P.; and Sanders, Larry W., 4,533,214, Cl. 350-334.000.

Tezucar, Okan K.; and Parisi, David A., to Burroughs Corporation. Gas-filled dot matrix display panel and operating system. 4,533,913, Cl. 340-805.000.

TH. Goldschmidt AG: *See*—
Weitemeyer, Christian, 4,533,723, Cl. 528-303.000.

Thackeray, James W.: *See*—
Campbell, John R.; and Thackeray, James W., 4,533,722, Cl. 528-199.000.

Thapar, Hemant K., to AT&T Information Systems. Method and apparatus for coding a binary signal. 4,534,040, Cl. 375-39.000.
Thatcher, John B. Swimming pool alarm. 4,533,907, Cl. 340-565.000.
Theeuwes, Felix: *See*—
Wolfe, Allan M.; Davenport, James M.; Theeuwes, Felix; and Yum, Su I., 4,533,348, Cl. 604-85.000.
Theodor Hymmen KG: *See*—
Dorries, Peter; and Wahl, Helmut, 4,533,590, Cl. 428-211.000.
Theodore, Ares N.; and Chattha, Mohinder S., to Ford Motor Company. Non-aqueous dispersions based on capped stabilizers and reactants comprising polyfunctional monomers II. 4,533,695, Cl. 524-504.000.
Theratronics, Inc.: *See*—
Carlisle, Floyd L., 4,532,938, Cl. 128-801.000.
Therm-O-Disc, Incorporated: *See*—
Bishop, Ralph L.; Rich, William N.; and Kowalski, Walter C., 4,533,894, Cl. 337-107.000.
Thermasol, Ltd.: *See*—
Altman, Murray; and Bellasalma, Gerald J., 4,533,512, Cl. 264-339.000.
Thoma, Klemens: *See*—
von der Bey, Thomas; Jankowski, Detlef; Schmidt, Hartmut; Thoma, Klemens; and Volker, Wolfgang, 4,532,779, Cl. 62-514.00R.
Thomas, Alan D.: *See*—
Jackman, Peter R.; and Thomas, Alan D., 4,533,801, Cl. 200-61.45R.
Thomas & Betts Corporation: *See*—
Brandeau, Edward P., 4,532,691, Cl. 29-566.400.
Wilson, Albert H., 4,533,200, Cl. 339-99.00R.
Thomas, David; and Briggs, Eugene C., to Koehring Company. Portable LP space heater. 4,532,914, Cl. 126-110.00C.
Thomas, David L.: *See*—
Swain, James C.; and Thomas, David L., 4,533,299, Cl. 417-222.000.
Thomas, David R.; and Tien, Paul C., to International Business Machines Corporation. FET Memory with drift reversal. 4,534,017, Cl. 365-149.000.
Thomas, Donald A.: *See*—
Tobey, William H.; Thomas, Donald A.; and Gardner, William J., 4,532,674, Cl. 16-295.000.
Thomas, Floyd L.: *See*—
Segerson, Eugene E.; and Thomas, Floyd L., 4,533,209, Cl. 350-96.200.
Thomas, Harvel W.: *See*—
Thomas, Philip D.; and Thomas, Harvel W., 4,533,118, Cl. 254-202.000.
Thomas, Philip D.; and Thomas, Harvel W. Stripper assembly for removing carpet. 4,533,118, Cl. 254-202.000.
Thomas, Renard L.: *See*—
Ishibe, Nobuyuki; Thomas, Renard L.; and Tasset, Emmett L., 4,533,653, Cl. 502-242.000.
Thomassen International: *See*—
Hendriks, Rudolf, 4,533,293, Cl. 415-117.000.
Thompson, Tommy L., to University of Arizona Foundation. Two stage cooling system. 4,532,777, Cl. 62-434.000.
Thomsen, Svend E.: *See*—
Petersen, Hans C.; Kyster, Erik; and Thomsen, Svend E., 4,533,303, Cl. 418-61.00B.
Thrasher, David L.: *See*—
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., 4,532,970, Cl. 141-98.000.
Thum, Oskar: *See*—
von Torklus, Detlef; Thum, Oskar; and Wilharm, Friedrich, 4,532,921, Cl. 128-80.00C.
Thurne Engineering Company Limited: *See*—
Antonissen, Peter, 4,532,840, Cl. 83-71.000.
Thyssen Aktiengesellschaft vorm. August Thyssen-Hutte: *See*—
Rellermeyer, Heinrich; and Kaas, Werner, 4,533,384, Cl. 75-0.5BA.
Tiemann, Jerome J.; and Engeler, William E., to General Electric Company. System for encoding and decoding video signals. 4,533,936, Cl. 358-12.000.
Tiemann, Jerome J.; Cutler, Scott E.; and Welles, Kenneth B., II, to General Electric Company. System for encoding and decoding video signals. 4,533,960, Cl. 358-310.000.
Tien, Paul C.: *See*—
Thomas, David R.; and Tien, Paul C., 4,534,017, Cl. 365-149.000.
Tien, Tseng-Ying, to Board of Regents acting for and on behalf of the University of Michigan, The. Ceramic compositions. 4,533,647, Cl. 501-105.000.
TII Industries, Inc.: *See*—
Smith, Thomas J., 4,533,971, Cl. 361-119.000.
Tilson, Alan L.; Quay, Earl R.; and Knight, John C., to Mayer, Wildman Industries, Inc. Pneumatic fiber recovery and redistribution system for sliver high pile fabric knitting machines. 4,532,780, Cl. 66-9.00B.
Tlaker, Erich, to Fellows Corporation. Temperature compensation apparatus for gear shapers. 4,533,858, Cl. 318-634.000.
TMC Corporation: *See*—
Gertsch, Ulrich, 4,533,156, Cl. 280-629.000.
Krob, Erwin; and Bauer, Helmut, 4,533,155, Cl. 280-628.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Izumi, Takayuki; Naito, Tsutomu; and Igarashi, Seiko, 4,533,461, Cl. 208-44.000.
Tobey, William H.; Thomas, Donald A.; and Gardner, William J., to Martin Marietta Corporation. Hinge assembly with over-center latch. 4,532,674, Cl. 16-295.000.
Toda, Toshimasa; and Kurumada, Tomoyuki, to Sankyo Company Limited. Tris(piperidylaminotriazylamino) compounds, their preparation and their use as polymer stabilizers. 4,533,688, Cl. 524-100.000.
Todaka, Isoo: *See*—
Souchi, Toshiyuki; and Todaka, Isoo, 4,532,687, Cl. 29-235.000.
Tokarzewski, Richard J.; and Schreiber, William L., to International Flavors & Fragrances Inc. Acetyl dimethylbutylcyclohexene and organoleptic uses thereof. 4,533,492, Cl. 252-522.00R.
Tokiguchi, Katsumi: *See*—
Itoh, Haruo; Tokiguchi, Katsumi; Warabisako, Terunori; Saitoh, Tadashi; and Tokuyama, Takashi, 4,533,831, Cl. 250-492.200.
Tokoro, Setsuo: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; and Tokoro, Setsuo, 4,532,798, Cl. 73-116.000.
Tokuyama Soda Kabushiki Kaisha: *See*—
Kusumoto, Koshi; Kawaguchi, Toshio; and Ogata, Takayuki, 4,533,701, Cl. 525-370.000.
Tokuyama, Takashi: *See*—
Itoh, Haruo; Tokiguchi, Katsumi; Warabisako, Terunori; Saitoh, Tadashi; and Tokuyama, Takashi, 4,533,831, Cl. 250-492.200.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fujii, Takashi; Ushizawa, Jisaburo; and Watanabe, Masayuki, 4,533,822, Cl. 219-553.000.
Fujinami, Yoshio; Itoyama, Katumi; and Ochiai, Hiroshi, 4,533,805, Cl. 200-304.000.
Iwai, Hiroshi, 4,532,696, Cl. 29-571.000.
Kameyama, Shuichi; Shinozaki, Satoshi; and Iwai, Hiroshi, 4,532,701, Cl. 29-576.00W.
Kondo, Takeo, 4,533,932, Cl. 357-13.000.
Konishi, Satoshi, 4,533,841, Cl. 307-468.000.
Mihara, Yuji, 4,534,046, Cl. 377-21.000.
Mochizuki, Toru, 4,533,935, Cl. 357-51.000.
Shinbara, Seitaro, 4,533,882, Cl. 332-16.00T.
Takada, Keisuke; and Okuhara, Hiroo, 4,533,990, Cl. 364-160.000.
Takaoka, Hiroshi; Furukawa, Toshiki; and Fukuda, Hiroshi, 4,532,761, Cl. 60-39.130.
Uchida, Kohachi, 4,533,235, Cl. 355-15.000.
Wakahara, Yasushi, 4,533,259, Cl. 374-166.000.
Watanabe, Fumio, 4,533,457, Cl. 204-411.000.
Watanabe, Yoshihiro, 4,533,824, Cl. 235-379.000.
Yasuhara, Hiroshi; Fujita, Hitoshi; and Okazaki, Kiyoshi, 4,533,946, Cl. 358-111.000.
Tolbert, William R.: *See*—
Lewis, Charles, Jr.; Olander, Jitka V.; and Tolbert, William R., 4,533,496, Cl. 260-112.00R.
Toma, Petre; Redford, David A.; Livesey, Declan B.; and Coates, Roy M., to Texaco Canada Resources Ltd. Well with sand control and stimulant deflector. 4,532,994, Cl. 166-303.000.
Tomaszewski, Walter: *See*—
Beneze, Heinz W.; and Tomaszewski, Walter, 4,532,744, Cl. 52-222.000.
Tomihira, Shigeru: *See*—
Takeuchi, Yasumasa; Sakakibara, Mitsuhiko; Tagata, Nobuo; Ogawa, Masaki; Hirata, Yasushi; and Tomihira, Shigeru, 4,533,711, Cl. 526-340.400.
Tomita, Koji: *See*—
Kawaguchi, Hiroshi; Konishi, Masataka; Sugawara, Koko; and Tomita, Koji, 4,533,631, Cl. 435-70.000.
Tomita, Naotaka; and Watanabe, Toshiyuki, to Bridgestone Tire Company Limited. Method and apparatus for detecting sound source. 4,532,807, Cl. 73-602.000.
Tomofuji, Yoshiaki; and Maeda, Takayoshi, to Matsushita Electric Works, Ltd. Power supply system. 4,533,987, Cl. 363-36.000.
Tone, Junsuke: *See*—
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,533,553, Cl. 514-460.000.
Topliffe, Douglas A.: *See*—
Funke, Michael J.; Topliffe, Douglas A.; and Rathbun, Donald J., 4,534,044, Cl. 375-120.000.
Torrington Company, The: *See*—
McGuffie, Michael J., 4,533,263, Cl. 384-454.000.
Tortorello, Anthony J.; Hansen, Nestor P.; and Jarocki, Kathryn M., to DeSoto, Inc. Imidazolidine-blocked amine polymers. 4,533,682, Cl. 523-414.000.
Toyama, Takanori: *See*—
Tanaka, Motoaki; Toyama, Takanori; Oba, Hitoshi; and Yamaguchi, Osamu, 4,533,652, Cl. 502-167.000.
Toyama, Takashi: *See*—
Ohkoshi, Akio; Toyama, Takashi; and Watanabe, Toshiro, 4,533,850, Cl. 313-36.000.
Toyo Bussan Kabushiki Kaisha: *See*—
Hoshino, Takahiro, 4,533,335, Cl. 441-102.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Obata, Saburo; and Ito, Kazuo, 4,533,273, Cl. 401-190.000.
Tanahashi, Toshifumi; and Itoh, Senji, 4,533,576, Cl. 428-35.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Minamide, Hiroshi; Shintani, Takashi; and Murayama, Hiroshi, 4,533,525, Cl. 428-469.000.
Toyoda Gosei Co., Ltd.: *See*—
Souchi, Toshiyuki; and Todaka, Isoo, 4,532,687, Cl. 29-235.000.

Toyoda Jidosha Kogyo Kabushiki Kaisha: *See*—
Hashimoto, Kametaro; Ushitani, Kenji; Noda, Fumiyoshi; Sugiyama, Masahiko; and Murachi, Mikio, 4,533,579, Cl. 428-36.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; Ina, Toshikazu; Shigematsu, Takashi; and Tokoro, Setsuo, 4,532,798, Cl. 73-116.000.
Komoda, Norio, 4,533,012, Cl. 180-68.300.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,382, Cl. 75-0.50C.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,383, Cl. 75-0.50C.
Miura, Hirohisa; Sato, Hiroshi; Natsume, Toshio; and Katagiri, Hidenori, 4,533,413, Cl. 148-420.000.
Mizuno, Hiroshi; and Ito, Hiroshi, 4,532,902, Cl. 123-417.000.
Trachtman, Joseph N. Methods and apparatus for accommodation training. 4,533,221, Cl. 351-203.000.
Trail-R-Van Inc.: *See*—
Lake, W. H. Russell, 4,533,171, Cl. 296-173.000.
Transamerica Delaval Inc.: *See*—
Samek, Norbert E., 4,533,217, Cl. 350-392.000.
Traynor, Sean G.: *See*—
Cherney, Leon; Gorman, Charles R.; Traynor, Sean G.; and Cardenas, Carlos G., 4,533,751, Cl. 564-408.000.
Trejo, Jesse; and Spector, George. Combined snow plow, grass cutter & tiller with adjustable chair. 4,532,725, Cl. 37-243.000.
Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,533,491, Cl. 252-522.00R.
Trias, John A.; and Marez, John, to United States of America, Navy. Real-time ultra-high resolution image projection display using laser-addressed liquid crystal light valve. 4,533,215, Cl. 350-347.00E.
Trischler, Erwin, to Siemens Corporate Research & Support, Inc. Random testing using scan path technique. 4,534,028, Cl. 371-25.000.
Trotz, Samuel I.; and Farmer, Douglas A., Jr., to Olin Corporation. Process for the prevention or reduction of discoloration of sodium pyrithione. 4,533,736, Cl. 546-290.000.
Trujillo, Thomas M.: *See*—
Wilson, Christopher W.; Trujillo, Thomas M.; and Zallen, Dennis M., 4,532,996, Cl. 169-23.000.
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; and Haarmann, Walter, to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Antithrombotic N-(6-chloro-pyrazin-2-yl)-4-Hydroxy-2H-1,2-benzothiazine-3-carboxamide-1,1-dioxide derivatives, composition, and method of use. 4,533,664, Cl. 514-225.000.
Trumps, Joseph S.: *See*—
Rogers, Jerrold J.; and Trumps, Joseph S., 4,533,861, Cl. 318-696.000.
Tsao, Sherman H.; and Zeiler, Kenneth T., to Mead Corporation, The. Ink jet printer with non-uniform rectangular pattern of print positions. 4,533,925, Cl. 346-75.000.
Tsubakimoto Chain Company: *See*—
Kondo, Hirokazu; and Takino, Shigekatsu, 4,532,869, Cl. 104-166.000.
Tsuchiya, Yutaka: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.
Tsuji, Teruji: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,533,730, Cl. 544-92.000.
Tsujii, Masahiko: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.
Tsunoda, Kazuhiko; and Hattori, Shigeru, to Honda Giken Kogyo Kabushiki Kaisha. Front brake system for motorcycles. 4,533,153, Cl. 280-277.000.
Tsuru, Masahiro: *See*—
Miyawaki, Yoshiharu; Hirose, Takeshi; Hamada, Yoneichi; Mizuoka, Seishi; and Tsuru, Masahiro, 4,532,980, Cl. 164-475.000.
Tubbs, Eldred F.: *See*—
McLauchlan, John M.; AuYeung, John; Tubbs, Eldred F.; Goss, Willis C.; and Psaltis, Demetri, 4,533,242, Cl. 356-5.000.
Tucker, Alfred D., to RIS Irrigation Systems Pty. Ltd. Drip feed device for irrigation purposes. 4,533,083, Cl. 239-542.000.
Tulen, Jack A.; and Tulen, James L. Multiple fixture for replacing worn hoe bits. 4,533,001, Cl. 172-438.000.
Tulen, James L.: *See*—
Tulen, Jack A.; and Tulen, James L., 4,533,001, Cl. 172-438.000.
Tullis, Barclay J.; Parikh, Mihir; Thrasher, David L.; and Johnston, Mark E., to Hewlett-Packard Company. Particle-free dockable interface for integrated circuit processing. 4,532,970, Cl. 141-98.000.
Tungatt, Paul D.: *See*—
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., 4,533,388, Cl. 75-76.000.
Turner, James A., to Dow Chemical Company, The. Naphthyridinyloxy(or thio)phenoxy propanoic acids, derivatives thereof and methods of herbicidal use. 4,533,381, Cl. 71-94.000.
Tutle, Edward G., to Martin Marietta Corporation. Robotic fruit harvester. 4,532,757, Cl. 56-328.00R.
Tvan, Tran A.: *See*—
Butz, Peter; Ranke, Gerhard; and Tvan, Tran A., 4,533,373, Cl. 62-17.000.
Tyler, Derek E.; Cheskis, Harvey P.; and Tungatt, Paul D., to Olin Corporation. Technique for removing iron-rich components from a copper melt. 4,533,388, Cl. 75-76.000.
Tyson, Sammie J. Ladder support. 4,533,018, Cl. 182-121.000.
U.M.E., Incorporated: *See*—
Chiarito, Richard J., 4,533,475, Cl. 210-788.000.
Ube Industries, Ltd.: *See*—
Nakamura, Yoichi; Watarai, Shumei; and Matsuo, Shohta, 4,533,602, Cl. 428-447.000.
Uchida, Kohachi, to Tokyo Shibaura Denki Kabushiki Kaisha. Cleaning device for use in an image forming apparatus. 4,533,235, Cl. 355-15.000.
Uchida, Shiichiro, to Shonetsugaku Kenkyusho Co., Ltd. Drying process and its apparatus utilizing a refrigeration cycle. 4,532,720, Cl. 34-27.000.
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, to Eisai Co., Ltd. Process for purifying secretin. 4,533,494, Cl. 260-112.50R.
Ueda, Takeo, to Nippon Seiko Kabushiki Kaisha. Seat belt latch device. 4,533,158, Cl. 280-804.000.
Uematsu, Ryuichi: *See*—
Okoshi, Koichi; and Uematsu, Ryuichi, 4,532,724, Cl. 36-7.10R.
Uemura, Seiichi; Yamamoto, Shunichi; Hirose, Takao; Takashima, Hiroaki; and Katoh, Osamu, to Nippon Oil Co., Ltd. Starting pitches for carbon fibers. 4,533,535, Cl. 423-447.400.
Uerdingen, Walter: *See*—
Waniczek, Helmut; Uerdingen, Walter; and Brudermanns, Karola, 4,533,728, Cl. 528-370.000.
Ueshima, Takashi: *See*—
Kurosawa, Shigeru; and Ueshima, Takashi, 4,533,721, Cl. 528-174.000.
Uhlig, Albert P., to Owens-Illinois, Inc. One-piece thermoplastic child-resistent dispensing closure. 4,533,058, Cl. 215-216.000.
Uhlig, Albert R., to Owens-Illinois, Inc. Dispensing closure valve. 4,533,071, Cl. 222-498.000.
Ukawa, Naohiko: *See*—
Shinoda, Naoharu; Tatani, Atsushi; Ukawa, Naohiko; and Okino, Susumu, 4,533,531, Cl. 423-242.000.
Ullman, Edwin F.: *See*—
Litman, David J.; and Ullman, Edwin F., 4,533,629, Cl. 435-7.000.
Ullrich, Kurt: *See*—
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Gant, Lawrence A., 4,533,183, Cl. 301-37.0TC.
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Ives, Kenneth D., 4,532,975, Cl. 164-150.000.
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Floyd, William M., 4,534,025, Cl. 370-85.000.
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Thompson, Tommy L., 4,532,777, Cl. 62-434.000.
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Wilson, Christopher W.; Trujillo, Thomas M.; and Zallen, Dennis M., 4,532,996, Cl. 169-23.000.
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Bengmark, Stig; Broome, Albert; and Overland, Christian H., 4,533,356, Cl. 604-358.000.
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Neuzil, Richard W.; and Fergin, Richard L., 4,533,398, Cl. 127-55.000.
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Aristoff, Paul A.; and Sih, John C., 4,533,749, Cl. 562-501.000.
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Urata, Yukihide; Moriuchi, Shigenori; Nakamura, Taku; and Ogawa, Masashi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive materials for plate making and method of reduction treatment for them. 4,533,623, Cl. 430-309.000.
Urban, Robert G., to Republic Steel Corporation. Method and apparatus to optimize cut lengths of material. 4,534,002, Cl. 364-475.000.
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Mitkov, Atanas L.; Georgiev, Ivan N.; Radulov, Peter T.; Hung, Le K.; and Atanassov, Atanas K., 4,532,940, Cl. 130-6.000.
Valencia, Jaime A.; and Denton, Robert D., to Exxon Production Research Co. Method and apparatus for separating carbon dioxide and other acid gases from methane by the use of distillation and a controlled freezing zone. 4,533,372, Cl. 62-12.000.
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Andrieux, Raymond, 4,533,260, Cl. 384-206.000.
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Valiulis, Mary M. Dual mandrel electric curling iron with separate angularly adjustable hair clamps. 4,533,819, Cl. 219-225.000.
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van Alem, Antonius A. M., to U.S. Philips Corporation. Opto-electronic focusing-error detection device. 4,533,826, Cl. 250-201.000.
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van den Elzen, Lambertus W. A.; van der Wouden, Adriaan; and Meijer, Auke, to Fundemantum B.V. Method for making a foundation pile. 4,533,279, Cl. 405-239.000.
Vanderlaan, Robert D.; and Meulendyk, John W., to Pneumo Corporation. Limited angle torque motor. 4,533,891, Cl. 335-272.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Soil cultivating machine. 4,532,999, Cl. 172-68.000.
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VanDiest, Scott A.: *See*—
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Andrews, Lawrence P.; Heath, Chester A.; Mead, Justin E.; VanDuren, Richard G.; and Janes, Gary A., 4,534,011, Cl. 364-900.000.
Van Gasselt, Max L. G.; and Rappoldt, Louis M., to Nederlandse Centrale Organisatie Voor Toegepast. Fluidized bed combustion apparatus. 4,532,871, Cl. 110-216.000.
van Gastel, Josephus M. M.; van Nunen, Hendrikus T.; and Sanders, Leonardus C. M., to U.S. Philips Corporation. Device for applying a fixing medium to components such as chip-type components. 4,532,884, Cl. 118-243.000.
van Helden, Robert; Baardman, Frank; and Syrier, Johannes L. M., to Shell Oil Company. Herbicidal urea compounds. 4,533,379, Cl. 71-88.000.
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Van Roessel, Frederik J., to U.S. Philips Corporation. Signal analyzing circuit for a periodically occurring signal. 4,533,953, Cl. 358-160.000.
van Thiel, Ronald R., to Xerox Corporation. Anti-backlash forms feed mechanism. 4,533,074, Cl. 226-74.000.
van Wegen, Wilhelmus F. S. M., to Metaverpa B.V. Mechanism for rotating an object over a determined angle about a vertical axis. 4,533,033, Cl. 198-413.000.
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Cory, John M.; Varney, Edward W.; Babcock, Jon A.; and Pupillo, Andrew, 4,533,114, Cl. 251-67.000.
Vater, George R.; and Allori, Aldo, to J. I. Case Company. Split seal ring with interlocking cut. 4,533,149, Cl. 277-221.000.
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Michel, Wolfgang; Paul, Heinz; Rummel, Andreas; Seher, Gero; Ossowski, Manfred; and Heberlein, Irmtrud, 4,533,438, Cl. 201-31.000.
Vejmelka, Peter; Kluger, Wolfgang; Koster, Rainer; and Hauser, Wolfgang, to Kernforschungszentrum Karlsruhe GmbH. Method of making a leach resistant fixation product of harmful water-containing waste and cement. 4,533,395, Cl. 106-89.000.
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Burks, William M., Jr.; Doane, Elliott P.; Campbell, Ramsey G.; and Velez, Emilio S., 4,533,473, Cl. 210-754.000.
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W.; Wilczenski, Chester; Dobbs, John; Kowalczyk, Ronald; Owen, Derek G.; and Banich, John N., 4,533,059, Cl. 215-230.000.

Verhoeven, John D.; Gibson, Edwin D.; Finnemore, Douglas K.; Ostenson, Jerome E.; Schmidt, Frederick A.; and Owen, Charles V., to United States of America, Energy. Method of preparing composite superconducting wire. 4,532,703, Cl. 29-599.000.

Verri, Vittorio; and Christiani, Renato, to Comber S.p.A. Costruzioni Meccaniche Bergamasche. Pressure filter with a tubular, flexible filter element which can be turned inside out. 4,533,472, Cl. 210-350.000.

Vestermark, Lyle A. Energy storing flywheel assembly. 4,532,769, Cl. 60-698.000.

Victor Company of Japan, Limited: *See*—
Owaki, Isao; Saito, Susumu; and Yamazaki, Masami, 4,533,964, Cl. 360-22.000.

Videocolor: *See*—
Di Passio, Attilio; and Pezzulo, Antimo, 4,533,610, Cl. 430-25.000.

Vincent De Araujo, Manuel A. Electric safety switch with removable conducting rod. 4,533,799, Cl. 200-52.00R.

Virnot, Alain D. Pilot assistance device. 4,533,918, Cl. 343-451.000.

Vistain, James E. Proximity measuring device for golfers. 4,532,712, Cl. 33-180.000.

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Harshbarger, John H., 4,533,950, Cl. 358-139.000.

Vitro-Tec Fideicomiso: *See*—
Cardenas-Franco, Luis; and Veazey-Menendez, Enrique, 4,532,956, Cl. 137-340.000.

Vittorio, Corni, to Comau S.p.A. Coding systems for elements of machine tools, particularly of the numerically controlled type. 4,533,823, Cl. 235-375.000.

Voest-Alpine Aktiengesellschaft: *See*—
Lugscheider, Walter; Mullner, Paul; Schiffer, Wilhelm; and Leutgob, Alois, 4,533,385, Cl. 75-10.00R.
Schubert, Hermann; Ahrens, Max; and Haissig, Manfred, 4,532,977, Cl. 164-442.000.

Voest Alpine International Co.: *See*—
Hargassner, Reinhard; Nugent, Thomas J.; Scheinecker, Alois; and Engel, Kurt, 4,532,981, Cl. 164-483.000.

Vogel, Siegfried F.: *See*—
Yeack-Scranton, Celia E.; and Vogel, Siegfried F., 4,532,802, Cl. 73-432.00R.

Volker, Wolfgang: *See*—
von der Bey, Thomas; Jankowski, Detlef; Schmidt, Hartmut; Thoma, Klemens; and Volker, Wolfgang, 4,532,779, Cl. 62-514.00R.

Volkswagenwerk Aktiengesellschaft: *See*—
Heidemeyer, Paulus; and Zantopp, Werner, 4,533,011, Cl. 180-65.200.
Knudel, Gunter, 4,532,741, Cl. 52-99.000.

Vollbrecht, Heinz-Rudiger, to SKW Trostberg Aktiengesellschaft. Process for obtaining cyanuric chloride in solid or liquid form. 4,533,733, Cl. 544-190.000.

Vollmayr, Norbert, to Johannes Heidenhain GmbH. Apparatus and method for determining signal parameters of periodic square wave signals. 4,534,004, Cl. 364-486.000.

Vollmer, Erwin H.; and Glatthaar, Manfred. Sawtooth grinding machine. 4,532,830, Cl. 76-45.000.

von der Bey, Thomas; Jankowski, Detlef; Schmidt, Hartmut; Thoma, Klemens; and Volker, Wolfgang, to Messer Griesheim GmbH. Device for generating a dry, cold air flow for treatment of rheumatic diseases. 4,532,779, Cl. 62-514.00R.

von der Decken, Claus-Benedict: *See*—
Iniotakis, Nicolaos; and von der Decken, Claus-Benedict, 4,533,539, Cl. 423-648.00A.

Von Holdt, John W. Simplified collapsible mold core. 4,533,312, Cl. 425-438.000.

von Karchowski, Wilhelm, to Laeis-Werke AG. Apparatus for producing deep, conical or cylindrical ceramic hollow bodies from a powdered or granular pressed mass by isostatic compression. 4,533,311, Cl. 425-405.00H.

Von Muller, Francis. Firearm magazine lock. 4,532,729, Cl. 42-1.0LP.

von Torklus, Detlef; Thum, Oskar; and Wilharm, Friedrich. Knee joint bandage. 4,532,921, Cl. 128-80.00C.

Vorwerk & Co. Interholding GmbH: *See*—
Komesker, Heinrich; and Helmes, Ludger, 4,532,667, Cl. 15-49.00C.

Vossebeld, Arnold: *See*—
Schrijver, Jan; and Vossebeld, Arnold, 4,533,696, Cl. 524-528.000.

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Gal, Jozsef; Gyarfas, Andras; Katko , Laszlo ; Racz, Gabor; Sarlos, Agoston; and Vozari, Gyula, 4,533,912, Cl. 340-783.000.

Vroomen, Albert, to Franz Muller GmbH & Co. Device for cutting seams free in a corduroy cutting machine and method for operating the same. 4,532,683, Cl. 26-10.00C.

Vyzkumny Ustav Bavlnarsky: *See*—
Marsicek, Zdenek; Janeba, Jaroslav; Pacha, Antonin; Pastrnak, Ales; Dykast, Jaroslav; and Prazak, Roman, 4,534,042, Cl. 377-16.000.

W. R. Grace & Co., Cryovac Div.: *See*—
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Wacker-Chemie GmbH: *See*—
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Wada, Isao: *See*—
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Waddill, Harold G., to Texaco, Inc. Epoxy resins with increased flexibility. 4,533,719, Cl. 528-111.000.

Wagner, Eugene R.; Barney, Charlotte L.; and Matthews, Donald P., to Merrell Dow Pharmaceuticals Inc. Hypoglycemic N-(2-substituted-3-Dialkylamino-2-propenylidene)-N-alkylalkanaminium salts. 4,533,677, Cl. 514-638.000.

Wagner, Frederick B., III; and Izbicki, Anthony J., to Wagner, Frederick B., III. High energy propellant. 4,533,415, Cl. 149-35.000.

Wahl, Helmut: *See*—
Dorries, Peter; and Wahl, Helmut, 4,533,590, Cl. 428-211.000.

Wajaroff, Theodor: *See*—
Lang, Gunther; and Wajaroff, Theodor, 4,532,950, Cl. 132-7.000.

Wakahara, Yasushi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for detecting the local temperature variations of an object and the sites of the temperature variations. 4,533,259, Cl. 374-166.000.

Wako Pure Chemical Industries, Ltd.: *See*—
Tanaka, Motoaki; Toyama, Takanori; Oba, Hitoshi; and Yamaguchi, Osamu, 4,533,652, Cl. 502-167.000.

Walinsky, Stanley W., to Pfizer Inc. Use of fumaric acid polymers as antiscalants. 4,533,709, Cl. 526-318.000.

Walker, Edward R. H., to Imperial Chemical Industries PLC. Amide derivatives. 4,533,656, Cl. 514-19.000.

Walker-Neer Manufacturing Co., Inc.: *See*—
Haney, Keith M., 4,533,055, Cl. 211-70.400.

Wallace, Barnie A., Jr.: *See*—
Pieslak, George; and Wallace, Barnie A., Jr., 4,533,419, Cl. 156-85.000.

Walles, Wilhelm E.; Keskey, William H.; and Young, Richard G., to Dow Chemical Company, The. Pigments for toiletries. 4,533,484, Cl. 252-117.000.

Walls, John E.; Dhillon, Major; and Bentley, Trisha, to American Hoechst Corporation. Acid stabilizers for diazonium compound condensation products. 4,533,619, Cl. 430-157.000.

Walls, John E.; and Dunder, Thomas A., to American Hoechst Corporation. Light sensitive co-condensates. 4,533,620, Cl. 430-157.000.

Walter, Leo, to Bucklee-Mears Company. Circuit board stiffening. 4,533,978, Cl. 361-419.000.

Walter, Thomas J., to Ethyl Corporation. Process for preparing antibacterial compounds. 4,533,735, Cl. 546-156.000.

Walters, Harry J.: *See*—
Gerben, Ralph D.; and Walters, Harry J., 4,532,820, Cl. 74-56.000.

Walton, Herbert H.; and Kehoe, Steven D., to Fisher Controls International, Inc. Bidirectional disc throttling valve. 4,532,961, Cl. 137-625.310.

Walton, Michael E.: *See*—
Farrell, George; Anderson, Diana M.; and Walton, Michael E., 4,533,527, Cl. 423-53.000.

Wan, Chung-Chu: *See*—
Kapoor, Deepak; Wan, Chung-Chu; and Wang, Rong Y., 4,533,389, Cl. 75-123.00B.

Wang, Ke-Chin; and Winkelbauer, Howard M., to Dresser Industries, Inc. Nitride bonded oxide refractories. 4,533,646, Cl. 501-97.000.

Wang, Ko P. Bronchoscopic needle assembly. 4,532,935, Cl. 128-753.000.

Wang, Rong Y.: *See*—
Kapoor, Deepak; Wan, Chung-Chu; and Wang, Rong Y., 4,533,389, Cl. 75-123.00B.

Wang, Shin-Yih: *See*—
Chang, Ten-Ho; and Wang, Shin-Yih, 4,533,857, Cl. 318-345.00A.

Wangermann, Jochen, to Gruner & Jahr Ag & Co. Collating machine. 4,533,132, Cl. 270-53.000.

Waniczek, Helmut; Uerdingen, Walter; and Brudermanns, Karola, to Bayer Aktiengesellschaft. Process for the production of high molecular weight polyester carbonates. 4,533,728, Cl. 528-370.000.

Waniczek, Helmut: *See*—
Wingler, Frank; Waniczek, Helmut; and Geyer, Otto-Christian, 4,533,397, Cl. 106-181.000.

Warabisako, Terunori: *See*—
Itoh, Haruo; Tokiguchi, Katsumi; Warabisako, Terunori; Saitoh, Tadashi; and Tokuyama, Takashi, 4,533,831, Cl. 250-492.200.

Ward, Albert W.: *See*—
DePalma, Vincent M.; and Ward, Albert W., 4,533,582, Cl. 428-64.000.

Ward, Brooke A., to United Kingdom Atomic Energy Authority. Laser pipe welder/cutter. 4,533,814, Cl. 219-121.0LD.

Ward, Jean R., to Pencept, Inc. Method and apparatus for removing noise at the ends of a stroke. 4,534,060, Cl. 382-54.000.

Ward, John, to Nabisco Brands, Inc. Low-fat spread and process. 4,533,561, Cl. 426-603.000.

Ward, John S.: *See*—
Matsumoto, Ken; and Ward, John S., 4,533,666, Cl. 514-277.000.

Warner-Lambert Company: *See*—
Deckert, Clinton L., 4,533,347, Cl. 604-81.000.
Piccolo, Dominic J.; and Feinerman, Deborah J., 4,533,556, Cl. 426-3.000.

Warner, Ronald E.: *See*—
Partington, Albert J.; and Warner, Ronald E., 4,533,298, Cl. 416-191.000.

Washizuka, Isamu; and Takeda, Yoshio, to Sharp Kabushiki Kaisha. Liquid crystal display. 4,533,213, Cl. 350-332.000.

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Yazaki, Akiko: *See*—
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Yeack-Scranton, Celia E.; and Vogel, Siegfried F., to International Business Machines Corporation. Apparatus for analyzing the interface between a recording disk and a read-write head. 4,532,802, Cl. 73-432.00R.

Yeda Research and Development Company Ltd.: *See*—
Cahen, David; Malkin, Shmuel; Horwitz, Benjamin; and Bults, Gerard, 4,533,252, Cl. 356-432.000.
Lahav, Meir; Addadi, Lia; and Weissbuch, Isabela, 4,533,506, Cl. 260-501.120.

Yeh, Ching C. Combination lock. 4,532,784, Cl. 70-312.000.

Yoden, Yoshimasa; Okuda, Tsuneo; Fuchigami, Eiji; and Kuwabara, Toshihiro, to Nitta Gelatin Co., Ltd. Process for producing a shaped product of collagen by syneresis. 4,533,358, Cl. 8-94.200.

Yokooku, Katsuhiko; Kaneko, Tadashi; and Nakazumi, Tadataka, to Mazda Motor Corporation. Fuel injection control system for controlling the fuel distribution to the cylinders of a multi-cylinder internal combustion engine. 4,532,905, Cl. 123-443.000.

Yokota, Akira, to Nissan Motor Company, Ltd. Belt type power transmitting system. 4,533,341, Cl. 474-109.000.

Yokozawa, Yukio, to Kabushiki Kaisha Suwa Seikosha. Portable programmable information device and external programming station. 4,534,012, Cl. 364-900.000.

Yonemitsu, Jun: *See*—
Yamamoto, Kaichi; and Yonemitsu, Jun, 4,533,937, Cl. 358-22.000.

Yoshida, Hideo: *See*—
Kishi, Ikuo; and Yoshida, Hideo, 4,533,546, Cl. 424-81.000.

Yoshida Kogyo K. K.: *See*—
Gartner, Karl, 4,532,746, Cl. 52-276.000.

Yoshida, Mamoru: *See*—
Kakinuma, Hiroaki; Yoshida, Mamoru; and Nishikawa, Satoshi, 4,533,564, Cl. 427-39.000.

Yoshida, Takao: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,533,491, Cl. 252-522.00R.

Yoshida, Tuneo; Oishi, Kengo; and Yagi, Motohiko, to Fuji Photo Film Co., Ltd. Ceramic guides for tape-like materials and process for the production thereof. 4,533,968, Cl. 360-130.210.

Yoshihara, Toshiyuki: *See*—
Fujimura, Naoto; Sonobe, Akihiro; Yoshihara, Toshiyuki; Takebayashi, Norie; Tanaka, Takashi; and Kuribayashi, Masaki, 4,533,232, Cl. 355-3.00R.

Yoshikawa, Yasuhiko: *See*—
Kimura, Hiroshi; Hisajima, Masahiko; Shibata, Kiyoshi; Irie, Yoichiro; Morimoto, Kiyoshi; Nagashima, Takashi; Yoshikawa, Yasuhiko; Yamamoto, Kiyonori; Watashi, Masahiro; Yoshinaga, Shinsuke; and Yamamoto, Toshihiko, 4,533,233, Cl. 355-8.000.

Yoshikuni, Yoshiaki: *See*—
Matsumura, Shingo; Enomoto, Hiroshi; Aoyagi, Yoshiaki; Yoshikuni, Yoshiaki; Kura, Kohei: Yagi, Masahiro; and Shirahase, Ichiro, 4,533,668, Cl. 514-321.000.

Yoshimura, Hisashi: *See*—
Iwagami, Fusao; and Yoshimura, Hisashi, 4,533,927, Cl. 346-140.00R.

Yoshimura, Susumu: *See*—
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Yoshinaga, Shinsuke: *See*—
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Yoshino, Hiroshi: *See*—
Uchiyama, Mikio; Sato, Takashi; Yoshino, Hiroshi; Tsuchiya, Yutaka; Konishi, Masayuki; Tsujii, Masahiko; Hisatake, Yoshihiko; and Koiwa, Atsushi, 4,533,494, Cl. 260-112.50R.

Yoshino, Masahito: *See*—
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Yoshino, Masaki, to Fuji Xerox Co., Ltd. Electrostatic printing method using heat sensitive thermal ink transfer. 4,532,865, Cl. 101-426.000.

Yoshioka, Atsushi: *See*—
Shibata, Akira; Wada, Isao; and Yoshioka, Atsushi, 4,533,961, Cl. 358-315.000.

Yoshioka, Kouichi; and Ochiai, Michihiko, to Takeda Chemical Industries, Ltd. Method of producing 2-azetidinone-1-sulfonic acid compounds. 4,533,495, Cl. 260-239.00A.

Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, to Shionogi & Co., Ltd. 1-Oxadethiacepham compounds. 4,533,730, Cl. 544-92.000.

Yoshioka, Shigehiko; Yamada, Hideto; Goto, Kimihiko; Adachi, Yoshio; and Miyahana, Kazuo, to Seiko Kagaku Kogyo Co., Ltd. Process for sizing paper and process for making plasterboard base paper sized thereby. 4,533,434, Cl. 162-124.000.

Yoshioka, Toshio: *See*—
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Yoshiyama, Harumichi: *See*—
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Young, Dennis: *See*—
Ball, William J.; Barri, Sami A. I.; and Young, Dennis, 4,533,649, Cl. 502-71.000.

Young, Richard G.: *See*—
Walles, Wilhelm E.; Keskey, William H.; and Young, Richard G., 4,533,484, Cl. 252-117.000.

Youngblood, Paul E. Control accessory for an acoustical guitar. 4,532,847, Cl. 84-1.160.

Yu, Michael C., to Phillips Petroleum Company. Polyarylate formation by ester interchange reaction using γ- gamma lactones as diluent. 4,533,720, Cl. 528-125.000.

Yu, Stella S. T.: *See*—
Pitzele, Barnett S.; Yu, Stella S. T.; Hamilton, Robert W.; and Moormann, Alan E., 4,533,739, Cl. 548-559.000.

Yukl, Tex. Noncontacting, hyperthermia method and apparatus for destroying living tissue in vivo. 4,532,939, Cl. 128-804.000.

Yum, Su I.: *See*—
Wolfe, Allan M.; Davenport, James M.; Theeuwes, Felix; and Yum, Su I., 4,533,348, Cl. 604-85.000.

Yutori, Toshio; and Ogawa, Rikuo, to Kabushiki Kaisha Kobe Seiko Sho. Process for producing steel wire or rods of high ductility and strength. 4,533,401, Cl. 148-12.00B.

Zago, Gianni, to Patents Engineering S.r.l. Protective helmet for the head with locking means. 4,532,658, Cl. 2-421.000.

Zallen, Dennis M.: *See*—
Wilson, Christopher W.; Trujillo, Thomas M.; and Zallen, Dennis M., 4,532,996, Cl. 169-23.000.

Zampino, Michael J.: *See*—
Wilson, Richard A.; Zampino, Michael J.; Bowen, David R.; and Luccarelli, Domenick, Jr., 4,533,746, Cl. 560-144.000.

Zander, Joachim: *See*—
Forsting, Bernd; Zander, Joachim; and Gustav, Jeske, 4,533,081, Cl. 237-12.30B.

Zantopp, Werner: *See*—
Heidemeyer, Paulus; and Zantopp, Werner, 4,533,011, Cl. 180-65.200.

Zaskalicky, Michael F., to United States Gypsum Company. Process for continuously calcining gypsum to low dispersed consistency stucco. 4,533,528, Cl. 423-171.000.

Zeiler, Kenneth T.: *See*—
Tsao, Sherman H.; and Zeiler, Kenneth T., 4,533,925, Cl. 346-75.000.

Zeller, Robert: *See*—
Esper, Friedrich J.; and Zeller, Robert, 4,533,392, Cl. 75-230.000.

Zemlyavichus, Pranas V.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., 4,533,243, Cl. 356-44.000.

Zenith Electronics Corporation: *See*—
Cornwell, Ross E., Jr.; Czech, John F.; and Domoleczny, James D., 4,533,105, Cl. 248-371.000.

Zeugner, Horst; Roemer, Dietmar; Liepmann, Hans; and Milkowski, Wolfgang, to Kali-Chemie Pharma GmbH. 2-Acylaminomethyl-1,4-benzodiazepine compounds and analgesic use. 4,533,662, Cl. 514-221.000.

Zhelnis, Mechislav V.: *See*—
Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., 4,533,243, Cl. 356-44.000.

Zhukov, Leonid F.; Chugunny, Evgeny G.; Samchenko, Garold P.; Shumikhin, Vladimir S.; Zhelnis, Mechislav V.; Kushinsky, Ivan V.; and Zemlyavichus, Pranas V., to Institut Problem Litiya Akademii Nauk Ukrainskoi SSR. Light guide for transmitting thermal radiation from melt to pyrometer and method of measuring temperature of molten metal in metallurgical vessel with the aid of said light guide. 4,533,243, Cl. 356-44.000.

Ziomek, Joseph F. Tow line handle. 4,533,334, Cl. 441-69.000.

Ziph, Benjamine: *See*—
Meijer, Roelf J.; Ziph, Benjamine; and Godett, Ted M., 4,532,855, Cl. 92-71.000.

Zirwick, Kurt, to Rohde & Schwarz GmbH & Co. KG. Circuit for automatically setting a predetermined frequency component of the sweep oscillator of a spectrum analyzer to a prescribed point of the frequency coordinates of a display device. 4,533,866, Cl. 324-77.00B.

Zoche, Gunter: *See*—
Neuschaeffer, Karl H.; Spielau, Paul; Zoche, Gunter; and Engels, Hans-Werner, 4,533,393, Cl. 106-18.120.

Zupancic, Ronald L.; and Urry, Lewis F., to Union Carbide Corporation. Method of making an electrochemical cell having a resealable vent closure. 4,532,705, Cl. 29-623.200.

Zysman, Alexandre: *See*—
Sebag, Henri; and Zysman, Alexandre, 4,533,714, Cl. 528-27.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF AUGUST, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Gardiner, Kenneth W.: *See—*
Schaefer, Louis F.; and Gardiner, Kenneth W., Re. 31,964, Cl. 355-10.000.

Kelman, Charles D. Intraocular lenses. Re. 31,963, Cl. 623-6.000.

Kerfoot, Frank W., Jr., to Syntex (U.S.A.) Inc. Compliantly mountable turbine cartridge assembly for gas-driven dental handpiece. Re. 31,965, Cl. 433-132.000.

Peerless Manufacturing Company: *See—*
Sillers, Donald A., Jr., Re. 31,966, Cl. 210-238.000.

Savin Corporation: *See—*
Schaefer, Louis F.; and Gardiner, Kenneth W., Re. 31,964, Cl. 355-10.000.

Schaefer, Louis F.; and Gardiner, Kenneth W., to Savin Corporation. Automatic development electrode bias control system. Re. 31,964, Cl. 355-10.000.

Sillers, Donald A., Jr., to Peerless Manufacturing Company. Multiple filter vessel. Re. 31,966, Cl. 210-238.000.

Syntex (U.S.A.) Inc.: *See—*
Kerfoot, Frank W., Jr., Re. 31,965, Cl. 433-132.000.

LIST OF DESIGN PATENTEES

Acushnet Company: *See—*
Worster, John A.; Giebel, Charles G.; and Lyon, Herbert W., 280,004, Cl. D21-219.000.

Akazawa, Shumi; and Hoshino, Kiyoshi, to Ryobi Limited. Driver drill. 279,957, 8-6-85, Cl. D8-61.000.

Akira, Nakamura; and Toshiyuki, Yamada, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle instrument cluster. 279,975, 8-6-85, Cl. D12-192.000.

Akira, Nakamura; and Toshiyuki, Yamada, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle display panel and support for instrument gauges. 279,976, 8-6-85, Cl. D12-192.000.

Alert Safety Lite Products Co.: *See—*
Kovacik, James D.; Blanch, Thomas J.; Blanch, Paul S.; and Kovacik, James W., 279,979, Cl. D13-30.000.

American Hospital Supply Corporation: *See—*
Bootman, Matthew W.; Schillke, Peter; and Laguette, Stephen W., 280,023, Cl. D24-56.000.

Anderson, George C., to Insilco Corporation. Container. 280,038, 8-6-85, Cl. D32-53.000.

Anderson, Samantha R.: *See—*
Vasquez, Julian; and Anderson, Samantha R., 279,942, Cl. D6-332.000.

Anglin, Richard T., Jr. Protector for toothbrush head. 279,941, 8-6-85, Cl. D4-199.000.

Annett, Leland W.: *See—*
Meyer, Robert P.; and Annett, Leland W., 280,019, Cl. D24-26.000.

AT&T Technologies, Inc.: *See—*
Genaro, Donald M.; Harden, Daniel K.; and McGarvey, John N., 279,982, Cl. D14-60.000.

Baker Perkins Export Pty. Ltd.: *See—*
Willett, Paul E., 279,955, Cl. D7-348.000.

Baker Perkins Exports Pty. Ltd.: *See—*
Willett, Paul E., 279,953, Cl. D7-338.000.
Willett, Paul E., 279,954, Cl. D7-338.000.

Ballarini, Luciano, to Castelli S.p.A. Combined seat and backrest unit for a chair. 279,947, 8-6-85, Cl. D6-501.000.

Benneche, Chris; Cronin, Richard W.; Linhart, Eugene M.; Ranes, Richard L.; and Welch, Darrell K., to Northrop Corporation. Unmanned aircraft. 280,007, 8-6-85, Cl. D22-11.000.

Bertone, Nuccio, to Northern Technologies Limited. Display cabinet for CRT. 279,987, 8-6-85, Cl. D14-113.000.

Blanch, Paul S.: *See—*
Kovacik, James D.; Blanch, Thomas J.; Blanch, Paul S.; and Kovacik, James W., 279,979, Cl. D13-30.000.

Blanch, Thomas J.: *See—*
Kovacik, James D.; Blanch, Thomas J.; Blanch, Paul S.; and Kovacik, James W., 279,979, Cl. D13-30.000.

Bonazelli, William F. Generator for fuel additive. 279,977, 8-6-85, Cl. D13-2.000.

Bootman, Matthew W.; Schillke, Peter; and Laguette, Stephen W., to American Hospital Supply Corporation. Wound drainage reservoir. 280,023, 8-6-85, Cl. D24-56.000.

Briggery Myles, Jacquelyn A. Swimwear. 279,936, 8-6-85, Cl. D2-41.000.

Broadway Industries, Inc.: *See—*
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 280,008, Cl. D23-25.000.
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 280,009, Cl. D23-25.000.
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 280,010, Cl. D23-32.000.

Brown, James N.; and Taylor, Darrell L. Stilt. 279,997, 8-6-85, Cl. D21-72.000.

Brussing, Bernd: *See—*
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Burn-Brite Lights Proprietary Limited: *See—*
Waters, Ivan L., 280,025, Cl. D26-24.000.

C. S. di Nosenzo Oreste: *See—*
Nosenzo, Oreste G., 280,011, Cl. D23-97.000.

Camens, Murray I. C., to U.S. Philips Corporation. Blood pressure meter. 280,017, 8-6-85, Cl. D24-17.000.

Carbajales Santa-Eulalia, Javier B.: *See—*
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Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 279,968, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 279,969, Cl. D11-158.000.
Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., 279,970, Cl. D11-162.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a water buffalo. 279,967, 8-6-85, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a lemur monkey. 279,968, 8-6-85, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of a big horn sheep. 279,969, 8-6-85, Cl. D11-158.000.

Carbajales Santa-Eulalia, Jesus A.; and Carbajales Santa-Eulalia, Javier B., to John J. Madison Company, Inc. Figurine of an ostrich. 279,970, 8-6-85, Cl. D11-162.000.

Castelli S.p.A.: *See—*
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Citizen Watch Co., Ltd.: *See—*
Kano, Hayao, 279,966, Cl. D10-125.000.

Clover Mfg. Co., Ltd.: *See—*
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Cohen, Michael. T-shirt. 279,937, 8-6-85, Cl. D2-208.000.

Commonwealth Industries: *See—*
Scott, Peter K., 280,018, Cl. D24-25.000.

Conair Corporation: *See—*
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Conti, Rino: *See—*
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Cronin, Richard W.: *See—*
Benneche, Chris; Cronin, Richard W.; Linhart, Eugene M.; Ranes, Richard L.; and Welch, Darrell K., 280,007, Cl. D22-11.000.

Daenen, Robert H. C. M.; and Conti, Rino, to Dart Industries Inc. Covered food storage container or the like. 279,952, 8-6-85, Cl. D7-79.000.

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Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 280,008, Cl. D23-25.000.
Miller, Charles D.; Daniels, Bernard O.; and McKeone, William C., 280,009, Cl. D23-25.000.
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Dickinson, H. Wade: *See*—
Veihl, Robert G., Jr.; Dickinson, Mart J.; and Dickinson, H. Wade, 279,995, Cl. D21-33.000.
Dickinson, Mart J.: *See*—
Veihl, Robert G., Jr.; Dickinson, Mart J.; and Dickinson, H. Wade, 279,995, Cl. D21-33.000.
Doyle, Edward J.; and Rittenhouse, James M., to Conair Corporation. Hair curler. 280,031, 8-6-85, Cl. D28-35.000.
Egan, Philip S.; Helmuth, Keld T.; Pimentel, Richard G.; and Soerensen, Tom B., to Phonic Ear, Inc. Hearing aid transducer or the like. 280,022, 8-6-85, Cl. D24-35.000.
Eyck, Richard T.; Fee, Robert W.; Robbins, Richard J.; and Liu, Shau-Min, to Rival Manufacturing Company. Food steaming pot. 279,956, 8-6-85, Cl. D7-354.000.
Fabrique Nationale Herstal S.A.: *See*—
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Fee, Robert W.: *See*—
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Firestone Tire & Rubber Company, The: *See*—
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First National Bank Of Rochester, Executor: *See*—
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Fortuna, Vincent E., to Cosden Technology, Inc. Container for flowable products. 279,962, 8-6-85, Cl. D9-375.000.
Gangbin, Irol G. Rotating light. 280,026, 8-6-85, Cl. D26-26.000.
Gavura, Steve. Combined bottle and cap. 279,960, 8-6-85, Cl. D9-373.000.
Genaro, Donald M.; Harden, Daniel K.; and McGarvey, John N., to AT&T Technologies, Inc. Telephone stand. 279,982, 8-6-85, Cl. D14-60.000.
Gerber, Ernst W. Transparent envelope. 279,990, 8-6-85, Cl. D19-3.000.
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Gribb, Stephen R. Dual tip marking instrument. 279,992, 8-6-85, Cl. D19-43.000.
Grimes, Gary E., to Timex Computer Corporation. Personal color computer. 279,983, 8-6-85, Cl. D14-100.000.
Groves, Michael H., to Stanley Works Limited, The. Planing tool. 279,958, 8-6-85, Cl. D8-90.000.
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Homsy, Charles A. Hip joint prosthesis. 280,020, 8-6-85, Cl. D24-33.000.
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Jones, Robert S. Buoyant belt. 280,005, 8-6-85, Cl. D21-238.000.
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Kenny, Michael: *See*—
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Mair, Alexander D. Method to improved acidulation quality of North Carolina phosphate rock. T105,701, 8–6–85, Cl. 423-167.

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275	4,532,791
319	4,532,792
342	4,532,793
442	4,532,794

CLASS 73

40	4,532,795
75	4,532,797
116	4,532,798
295	4,532,799
308	4,532,800
432 R	4,532,801
	4,532,802
471	4,532,803
478	4,532,804
579	4,532,806
602	4,532,807
632	4,532,796
640	4,532,808
701	4,532,809
717	4,532,810
861.05	4,532,811
861.27	4,532,812
863.02	4,532,813
863.03	4,532,814
863.32	4,532,805
864.63	4,532,815
864.91	4,532,816

CLASS 74

10.33	4,532,817
	4,532,818
44	4,532,819
56	4,532,820
370	4,532,821
397	4,532,822
473 R	4,532,823
475	4,532,824
532	4,532,825
553	4,532,826
745	4,532,827
793	4,532,828
869	4,532,829

CLASS 75

0.5 BA	4,533,384
0.5 C	4,533,382
	4,533,383
10 R	4,533,385
	4,533,386
66	4,533,387
76	4,533,388
123 B	4,533,389
126 Q	4,533,390
128 A	4,533,391
230	4,533,392

CLASS 76

45	4,532,830

CLASS 81

3.43	4,532,831
16	4,532,834
57.29	4,532,832
64	4,532,833
128	4,532,835
483	4,532,836

CLASS 82

4 C	4,532,837

CLASS 83

13	4,532,838
29	4,532,839
71	4,532,840
102.1	4,532,841
404.1	4,532,842
409	4,532,843
477.1	4,532,844
552	4,532,845
796	4,532,846

CLASS 84

1.16	4,532,847
1.19	4,532,848
1.22	4,532,849
173	4,532,850

CLASS 89

7	4,532,851
136	4,532,852

CLASS 91

165	4,532,853
472	4,532,854

CLASS 92

71	4,532,855
168	4,532,856

CLASS 99

483	4,532,857
534	4,532,858

CLASS 100

35	4,532,859
90	4,532,860
233	4,532,861

CLASS 101

93.32	4,532,862
153	4,532,863
219	4,532,864
426	4,532,865

CLASS 102

204	4,532,866
213	4,532,867
527	4,532,868

CLASS 104

166	4,532,869

CLASS 106

18.12	4,533,393
38.2	4,533,394
89	4,533,395
100	4,533,396
181	4,533,397

CLASS 109

58	4,532,870

CLASS 110

216	4,532,871
255	4,532,872
347	4,532,873

CLASS 112

235	4,532,874
262.2	4,532,875
454	4,532,876

CLASS 114

144 E	4,532,877
222	4,532,878
230	4,532,879
298	4,532,880

CLASS 118

20	4,532,881
108	4,532,882
243	4,532,884
308	4,532,885
326	4,532,886
429	4,532,887
718	4,532,888
	4,532,889

CLASS 119

1	4,532,890
4	4,532,883
51 FS	4,532,891
51 R	4,532,892

CLASS 123

41.31	4,532,893
142.5 E	4,532,894
187.5 R	4,532,895
193 H	4,532,896
196 R	4,532,897
276	4,532,898
292	4,532,899
327	4,532,900
333	4,532,901
417	4,532,902
436	4,532,903
439	4,532,904
443	4,532,905
470	4,532,906
490	4,532,907
493	4,532,908
590	4,532,909

CLASS 126

9 B	4,532,910
27	4,532,911
30	4,532,912
58	4,532,913
110 C	4,532,914
242	4,532,915
424	4,532,916
430	4,532,917

CLASS 127

55	4,533,398

CLASS 128

6	4,532,918
54	4,532,919
79	4,532,920
80 C	4,532,921
91 R	4,532,922
205.13	4,532,923
303.17	4,532,924
325	4,532,925
334 C	4,532,926
	4,532,927
335.5	4,532,928
	4,532,929
419 PG	4,532,931
419 R	4,532,930
631	4,532,932
660	4,532,933
697	4,532,934
753	4,532,935
759	4,532,937
762	4,532,936
801	4,532,938
804	4,532,939

CLASS 130

6	4,532,940
27 R	4,532,941

CLASS 131

198.1	4,532,942
277	4,532,944
291	4,532,945
327	4,532,946
331	4,532,947
336	4,532,943

CLASS 132

7	4,532,950

CLASS 134

6	4,533,399

CLASS 135

67	4,532,948

CLASS 136

249	4,533,783

CLASS 137

1	4,532,949
15	4,532,955
84	4,532,951
240	4,532,952
255	4,532,953
302	4,532,954
340	4,532,956
375	4,532,957
454.2	4,532,958
516.13	4,532,959
596.13	4,532,960
625.31	4,532,961
842	4,532,962

CLASS 139

59	4,532,963
435	4,532,964
	4,532,965

CLASS 140

105	4,532,966

CLASS 141

3	4,532,967
5	4,532,968
27	4,532,969
98	4,532,970
142	4,532,971

CLASS 148

4	4,533,400
12 B	4,533,401
12.4	4,533,402
19	4,533,403
23	4,533,404
36	4,533,405
37	4,533,406
102	4,533,407
103	4,533,408
111	4,533,409
175	4,533,410
402	4,533,411
411	4,533,412
420	4,533,413
427	4,533,414

CLASS 149

35	4,533,415
	4,533,416

CLASS 150

100	4,532,972

CLASS 156

51	4,533,417
52	4,533,418
85	4,533,419
138	4,533,420
244.12	4,533,421
307.3	4,533,422
359	4,533,423
378	4,533,424
466	4,533,425
492	4,533,426
500	4,533,427
608	4,533,428
643	4,533,429
	4,533,430
	4,533,431

CLASS 159

47.1	4,533,432
47.3	4,533,433

CLASS 160

235	4,532,973

CLASS 162

124	4,533,434
161	4,533,435
261	4,533,436
281	4,533,437

CLASS 164

132	4,532,974
150	4,532,975
363	4,532,976
442	4,532,977
448	4,532,978

463 4,532,979
475 4,532,980
483 4,532,981

CLASS 165

1 4,532,982
47 4,532,983
61 4,532,984
118 4,532,985

CLASS 166

50 4,532,986
75.1 4,532,987
176 4,532,988
188 4,532,989
248 4,532,990
261 4,532,991
267 4,532,992
303 4,532,993
4,532,994
327 4,532,995

CLASS 169

23 4,532,996
56 4,532,997

CLASS 172

15 4,532,998
68 4,532,999
4,533,000
266 4,532,790
438 4,533,001

CLASS 173

53 4,533,002

CLASS 174

36 4,533,784
42 4,533,785
50 4,533,786
68.5 4,533,787
88 C 4,533,788
102 R 4,533,789
115 4,533,790

CLASS 175

269 4,533,003
329 4,533,004
393 4,533,005

CLASS 177

25 4,533,006
50 4,533,007
132 4,533,008
139 4,533,009

CLASS 179

2 R 4,533,791
84 C 4,533,792
99 R 4,533,793
111 E 4,533,795
111 R 4,533,794
186 4,533,796

CLASS 180

41 4,533,010
65.2 4,533,011
68.3 4,533,012
210 4,533,013
287 4,533,016

CLASS 181

280 4,533,015

CLASS 182

3 4,533,017
121 4,533,018

CLASS 184

14 4,533,019
55.2 4,533,020

CLASS 187

29 R 4,533,021

CLASS 188

18 R 4,533,022
73.34 4,533,023
73.44 4,533,025
79.5 B 4,533,024
184 4,533,026

CLASS 192

0.052 4,533,030
8 C 4,533,027
13 A 4,533,028
18 A 4,533,029
106.2 4,533,031
107 M 4,533,032

CLASS 198

413 4,533,033
472 4,533,034
499 4,533,035
4,533,036
4,533,037
646 4,533,038
651 4,533,039
847 4,533,040

CLASS 200

11 R 4,533,798
11 TC 4,533,797
52 R 4,533,799
61.39 4,533,800
61.45 R 4,533,801
81.9 R 4,533,802
153 K 4,533,803
159 R 4,533,804
304 4,533,805

CLASS 201

31 4,533,438
41 4,533,439

CLASS 204

1 T 4,533,440
3 4,533,441
68 4,533,442
84 4,533,443
129.43 4,533,444
159.19 4,533,445
159.24 4,533,446
181.4 4,533,447
181.7 4,533,448
192 R 4,533,449
192 S 4,533,450
229 4,533,451
243 R 4,533,452
252 4,533,453
272 4,533,454
279 4,533,455
411 4,533,457
415 4,533,456

CLASS 206

63.3 4,533,041
223 4,533,042
328 4,533,043
362 4,533,044
362.3 4,533,045
389 4,533,046
434 4,533,047
455 4,533,048
4,533,049
545 4,533,050
563 4,533,051
602 4,533,052

CLASS 208

3 4,533,458
11 LE 4,533,459
4,533,460
44 4,533,461
88 4,533,462
127 4,533,463

CLASS 209

158 4,533,464
167 4,533,465
4,533,466
4,533,467
172 4,533,468
243 4,533,469
636 4,533,053
687 4,533,054

CLASS 210

96.1 4,533,470
138 4,533,471
238 Re.31,966
350 4,533,472
754 4,533,473
787 4,533,474
788 4,533,475
805 4,533,476

CLASS 211

70.4 4,533,055
153 4,533,056

CLASS 215

11 E 4,533,057
216 4,533,058
230 4,533,059

CLASS 219

8.5 4,533,806
10.49 A 4,533,808
10.49 R 4,533,807
10.55 B 4,533,810
10.55 M 4,533,809
69 M 4,533,811
121 LD 4,533,814
121 LF 4,533,815
121 LH 4,533,812
4,533,813
137.31 4,533,816
137.71 4,533,817
222 4,533,818
225 4,533,819
411 4,533,820
545 4,533,821
553 4,533,822

CLASS 220

3.9 4,533,060
4 B 4,533,061
258 4,533,062
270 4,533,063
273 4,533,064
462 4,533,065

CLASS 221

211 4,533,066

CLASS 222

135 4,533,067
189 4,533,068
209 4,533,069
439 4,533,070
498 4,533,071

CLASS 223

67 4,533,072

CLASS 225

4 4,533,073

CLASS 226

74 4,533,074

CLASS 227

55 4,533,075
67 4,533,076
156 4,533,077

CLASS 228

45 4,533,078

CLASS 229

31 R 4,533,079

CLASS 235

375 4,533,823
379 4,533,824
463 4,533,825

CLASS 236

49 4,533,080

CLASS 237

12.3 B 4,533,081

CLASS 239

102 4,533,082
542 4,533,083

CLASS 241

1 4,533,084
4,533,085
16 4,533,086
65 4,533,087
186.3 4,533,088

CLASS 242

7.21 4,533,089
75 4,533,090
129.6 4,533,091
186 4,533,092
197 4,533,093

CLASS 244

3.22 4,533,094
23 D 4,533,095
75 R 4,533,096
78 4,533,097
110 B 4,533,098
153 R 4,533,099
158 R 4,533,100
199 4,533,101

CLASS 248

74.1 4,533,102
179 4,533,103
245 4,533,104
371 4,533,105
421 4,533,106
430 4,533,107
467 4,533,108
542 4,533,109
573 4,533,110

CLASS 249

2 4,533,111
3 4,533,112

CLASS 250

201 4,533,826
211 K 4,533,827
216 4,533,828
227 4,533,829
231 SE 4,533,830
492.2 4,533,831
519.1 4,533,832
551 4,533,833
554 4,533,834

CLASS 251

63.4 4,533,113
67 4,533,114
142 4,533,115

CLASS 252

8.55 D 4,533,478
8.9 4,533,477
34 4,533,479
46.4 4,533,480
49.6 4,533,481
56 R 4,533,482
70 4,533,483
117 4,533,484
156 4,533,485
4,533,486
170 4,533,487
299.61 4,533,488
301.17 4,533,489
305 4,533,490
522 R 4,533,491
4,533,492

CLASS 254

26 R 4,533,116
94 4,533,117
202 4,533,118
344 4,533,119

CLASS 256

52 4,533,120
67 4,533,121
69 4,533,122

CLASS 260

112 B 4,533,493
112 R 4,533,496
112.5 R 4,533,494
239 A 4,533,495
4,533,497
243.3 4,533,498
391 4,533,499
404 4,533,500
428 4,533,501
463 4,533,504
465 R 4,533,505
501.12 4,533,506

CLASS 261

61 4,533,123
153 4,533,507

CLASS 264

22 4,533,508
171 4,533,509
4,533,510
184 4,533,511
339 4,533,512

CLASS 266

225 4,533,124
226 4,533,125

CLASS 267

141 4,533,126

CLASS 269

17 4,533,127
58 4,533,128
207 4,533,129

CLASS 270

41 4,533,130
52.5 4,533,131
53 4,533,132

CLASS 271

9 4,533,133
240 4,533,134
275 4,533,135

CLASS 272

73 4,533,136
99 4,533,137

CLASS 273

26 R 4,533,138
73 J 4,533,139
84 R 4,533,140
86 C 4,533,141
129 W 4,533,142
144 B 4,533,143
311 4,533,144
378 4,533,145
422 4,533,146

CLASS 277

26 4,533,147
53 4,533,148
221 4,533,149

CLASS 280

12 H 4,533,150
47.25 4,533,151
251 4,533,152
277 4,533,153
615 4,533,154
628 4,533,155
629 4,533,156
718 4,533,157
804 4,533,158
810 4,533,159

CLASS 282

23 R 4,533,160

CLASS 285

1 4,533,161
27 4,533,162

CLASS 289

1.5 4,533,163
2 4,533,164

CLASS 290

43 4,533,835

CLASS 292

68 4,533,165

CLASS 293

120 4,533,166

CLASS 294

86.4 4,533,167

CLASS 296

1 S 4,533,168
37.2 4,533,169
78 A 4,533,170
173 4,533,171
185 4,533,172
216 4,533,173

CLASS 297

16 4,533,174
232 4,533,175
238 4,533,176
301 4,533,177
349 4,533,178
440 4,533,179

CLASS 299

1 4,533,180
2 4,533,181
4,533,182

CLASS 301

37 TC 4,533,183
63 R 4,533,184

CLASS 303

3 4,533,185

CLASS 307

11 4,533,836
116 4,533,837
270 4,533,838
4,533,839
306 4,533,840
468 4,533,841
475 4,533,842
530 4,533,843
4,533,844
540 4,533,845
550 4,533,846

CLASS 308

5 R 4,533,186

CLASS 310

181 4,533,847
237 4,533,848
330 4,533,849

CLASS 313

36 4,533,850
51 4,533,851
346 DC 4,533,852

CLASS 315

117 4,533,853
4,533,854
370 4,533,855

CLASS 318

6 4,533,856
345 A 4,533,857
634 4,533,858
661 4,533,859
673 4,533,860
696 4,533,861
798 4,533,862

CLASS 322

28 4,533,863

CLASS 324

51 4,533,864
4,533,865
77 B 4,533,866
78 R 4,533,867
83 R 4,533,868
158 D 4,533,870
158 R 4,533,869
207 4,533,871
252 4,533,872

CLASS 328

155 4,533,873

CLASS 329

50 4,533,874

CLASS 330

4 4,533,875
253 4,533,876
4,533,877
261 4,533,878

CLASS 331

1 A 4,533,879
4,533,880
36 C 4,533,881

CLASS 332

16 T 4,533,882

CLASS 333

1 4,533,883
26 4,533,884
191 4,533,885
218 4,533,886
256 4,533,887

CLASS 335

131 4,533,888
199 4,533,889
234 4,533,890
272 4,533,891

CLASS 336

147 4,533,892

CLASS 337

5 4,533,893
107 4,533,894
165 4,533,895
232 4,533,896
408 4,533,897

CLASS 338

25 4,533,898
128 4,533,899

CLASS 339

17 CF 4,533,187
4,533,188
4,533,189
21 R 4,533,190
31 R 4,533,191
45 M 4,533,192
65 4,533,193
91 R 4,533,194
97 P 4,533,195
4,533,196
97 R 4,533,197
99 R 4,533,198
4,533,199
4,533,200
4,533,201
176 M 4,533,203
176 MP 4,533,202
221 R 4,533,204
247 4,533,205
258 R 4,533,206

CLASS 340

52 R 4,533,900
4,533,901
347 AD 4,533,903
347 P 4,533,902
521 4,533,904
524 4,533,905
541 4,533,906
565 4,533,907
626 4,533,908
703 4,533,909
721 4,533,910
727 4,533,911
783 4,533,912
805 4,533,913
825.79 4,533,914

CLASS 343

5 W 4,533,915
7.4 4,533,916
379 4,533,917
451 4,533,918
786 4,533,919

CLASS 346

1.1 4,533,920
4,533,921
4,533,922
4,533,923
49 4,533,924
75 4,533,925
136 4,533,926
140 R 4,533,927
4,533,928
209 4,533,929
211 4,533,930

CLASS 350

96.14 4,533,207
96.16 4,533,208
96.20 4,533,209
96.30 4,533,210
162.12 4,533,211
318 4,533,212
332 4,533,213

334 4,533,214
347 E 4,533,215
361 4,533,216
392 4,533,217
430 4,533,218
487 4,533,219
507 4,533,220

CLASS 351

203 4,533,221
206 4,533,222
4,533,223

CLASS 354

77 4,533,224
322 4,533,225
403 4,533,226
4,533,227

CLASS 355

1 4,533,228
3 CH 4,533,230
3 DD 4,533,229
3 FU 4,533,231
3 R 4,533,232
8 4,533,233
10 Re.31,964
14 D 4,533,234
15 4,533,235
4,533,236
40 4,533,237
68 4,533,238
72 4,533,239
125 4,533,240

CLASS 356

1 4,533,241
5 4,533,242
44 4,533,243
71 4,533,244
73 4,532,723
238 4,533,245
317 4,533,246
345 4,533,247
350 4,533,248
4,533,249
4,533,250
384 4,533,251
432 4,533,252
443 4,533,253

CLASS 357

10 4,533,931
13 4,533,932
15 4,533,933
23.7 4,533,934
51 4,533,935

CLASS 358

12 4,533,936
22 4,533,937
27 4,533,938
28 4,533,939
44 4,533,940
75 4,533,941
78 4,533,942
85 4,533,943
107 4,533,944
109 4,533,945
111 4,533,946
4,533,947
122 4,533,948
4,533,949
139 4,533,950
141 4,533,951
160 4,533,952
4,533,953
212 4,533,954
260 4,533,956
261 4,533,957
280 4,533,958
4,533,959
310 4,533,960
315 4,533,961

CLASS 360

5 4,533,962
19.1 4,533,963
22 4,533,964
62 4,533,965
96.5 4,533,966
123 4,533,967
130.21 4,533,968
132 4,533,969

CLASS 361

58 4,533,970
119 4,533,971
156 4,533,972
253 4,533,973
320 4,533,974
323 4,533,975
395 4,533,976
415 4,533,977
419 4,533,978

CLASS 362

97 4,533,979
110 4,533,980
151 4,533,981
183 4,533,982
223 4,533,983
232 4,533,984
276 4,533,985

CLASS 363

17 4,533,986
36 4,533,987
127 4,533,988
132 4,533,989

CLASS 364

160 4,533,990
164 4,533,991
200 4,533,992
4,533,993
4,533,994
4,533,995
4,533,996
4,533,997
424 4,533,998
428 4,534,000
429 4,533,999
474 4,534,001
475 4,534,002
476 4,534,003
486 4,534,004
505 4,534,005
513 4,534,006
560 4,534,007
716 4,534,008
726 4,534,009
748 4,534,010
900 4,534,011
4,534,012
4,534,013

CLASS 365

100 4,534,014
106 4,534,015
128 4,534,016
149 4,534,017
228 4,534,018

CLASS 366

108 4,533,255
176 4,533,254

CLASS 367

75 4,534,019
188 4,534,020

CLASS 368

111 4,533,256
202 4,533,257

CLASS 369

47 4,534,021
170 4,534,022

CLASS 370

58 4,534,023
85 4,534,024
4,534,025
100 4,534,026

CLASS 371

8 4,534,027
10 4,534,029
25 4,534,028
4,534,030
38 4,534,031

CLASS 372

34 4,534,032
50 4,534,033
59 4,534,034
85 4,534,035

CLASS 374

36 4,533,258
166 4,533,259

CLASS 375

10 4,534,036
25 4,534,037
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94 4,534,041
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120 4,534,044

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152 4,534,052
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454 4,533,263
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636 4,533,270

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CLASS 405

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CLASS 406

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CLASS 407

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451.2 4,533,313

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216 4,533,572
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559		4,533,739	152		4,533,747			4,533,756	842		4,533,771
	CLASS 549			CLASS 562				4,533,757	860		4,533,772
328		4,533,740	401		4,533,748	648		4,533,759			4,533,773
455		4,533,741	501		4,533,749	667		4,533,760	866		4,533,774
475		4,533,742	600		4,533,750	673		4,533,761	905		4,533,775
489		4,533,743		CLASS 564		677		4,533,762	946		4,533,776
	CLASS 556		408		4,533,751	716		4,533,763		CLASS 570	
173		4,533,503	428		4,533,752	724		4,533,764	144		4,533,777
479		4,533,744		CLASS 568		763		4,533,765		CLASS 585	
	CLASS 560		47		4,533,753	771		4,533,766	13		4,533,778
28		4,533,745	437		4,533,754	805		4,533,767	259		4,533,779
						806		4,533,769	330		4,533,780

516		4,533,781	345		4,533,355			
520		4,533,782	358		4,533,356			
	CLASS 604			CLASS 609				
43		4,533,345	401		4,533,357			
66		4,533,346		CLASS 623				
81		4,533,347	2		4,532,659			
85		4,533,348	6		Re.31,963			
174		4,533,349	18		4,532,660			
253		4,533,350	23		4,532,661			
293		4,533,351		CLASS 638				
317		4,533,352	630		4,533,758			
321		4,533,353						
323		4,533,354						

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D1—	111	279,935		338	279,953	D12—	147	279,971	D16—	104	279,989	D22—	7	280,006
D2—	41	279,936			279,954		157	279,972	D19—	3	279,990		11	280,007
	208	279,937		348	279,955		158	279,973		21	279,991	D23—	25	280,008
D3—	18	279,938		354	279,956		186	279,974		43	279,992			280,009
	42	279,939	D8—	61	279,957		192	279,975		45	279,993		32	280,010
	76	279,940		90	279,958			279,976		97	279,994		97	280,011
D4—	199	279,941		396	279,959	D13—	2	279,977	D21—	33	279,995		128	280,012
D6—	332	279,942	D9—	373	279,960		24	279,978		51	279,996		149	280,013
	375	279,943		375	279,961		30	279,979		72	279,997		150	280,014
	382	279,944			279,962	D14—	53	279,981		122	280,000	D24—	10	280,015
	449	279,945	D10—	57	279,963		60	279,982		191	280,001			280,016
	479	279,946		62	279,964		62	279,980		192	280,002		17	280,017
	501	279,947		120	279,965		100	279,983		194	280,003		25	280,018
D7—	9	279,948		125	279,966		109	279,984		199	279,998		26	280,019
	23	279,949	D11—	158	279,967		111	279,985		219	280,004		33	280,020
	73	279,950			279,968		113	279,986		221	279,999		34	280,021
	74	279,951			279,969			279,987		238	280,005		35	280,022
	79	279,952		162	279,970	D15—	140	279,988						

	56	280,023						
D25—	80	280,024						
D26—	24	280,025						
	26	280,026						
	40	280,027						
	49	280,028						
	50	280,029						
	60	280,030						
D28—	35	280,031						
	89	280,032						
D32—	22	280,033						
	24	280,034						
	37	280,035						
	47	280,036						
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	53	280,038						
D34—	24	280,039						

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